Protection Professionals
325 US RT 1
Falmouth, ME 04105

Waterville Municipal Fire Alarm Proposal

A. Project

Protection Professionals is offering the included estimates based on the RFP to upgrade the existing fire alarm DIGITIZE receiver and call boxes for the Waterville Fire Department and the walkthrough on July 22nd.

This project includes two stand-alone systems located at the Fire Department and Police Department. The two systems will be fully integrated as one system under normal operations but will function independently in case of equipment or communication failure.

The system will able to accept new installations within your licensed frequency. We suggest getting a 50-mile radius license to cover your regional dispatch with plenty of room to grow.

We are also providing a separate estimate for per location installations of AES Masterboxes.

B. Scope of Services and Design

Protection Professionals will provide the equipment and labor necessary for the complete replacement and testing of the new fire alarm receivers, except as exclude based on the walkthrough briefing and detailed in the estimate. Based on the walkthrough we will not be installing 120v outlets, running cat cabling, any fiber work or any tower work. Because you can do these things internally, or with your existing venders, this lowers the estimate cost.

1. Two Fire Alarm Receivers- Instead of the System 3505 Prism Lx we are offering the WARN system. The WARN system will automate the signals from both Wireless receivers and the existing 100 milliamp masterboxes. It will also have the capability to resounding the box numbers of both systems using the existing Form 4. An A/B switch will be provided that will be able to turn off outside access to the IP network. This switch will be able to be operated physically and by network command from the Dispatch Consoles. An indicator will show the current state.

2. Two Wireless Fire Alarm Receivers- AES 7705ii Receivers with printers, surge suppression, UPS battery backup, antennas and cable will be provided. One at FD and one at PD. If tower contractor provides antennas, cable or surge protection this will be credited back without restocking fee.

3. Three Dispatch Consoles- Included in Estimate are 3 computers and licensed software for the WARN system. Two at PD and one at FD. All three will be able to be run by either WARN receiver in case of receiver failure.

4. Fire Alarm Call Boxes- Our per installation estimate includes the new 7707 2.0 AES 8 zone fire boxes that can also do security zones. Optional pricing will be included for larger antennas or exterior antenna installation. Also, less expensive security only boxes are available for monitoring non-fire points such as security, panic buttons, low temp, high temp, high water and anything else that can trip a relay. Security boxes can also be used as repeaters to increase the range of the mesh network.

5. Labor Rates- $110 per hour for Municipalities.

C. Propagation Study

Protection Professionals will provide a propagation study based on the two towers and locations provided during the walkthrough. This will include our suggestions on order of installation.

D. Project Timeline

Our equipment suppliers tell us that the equipment will be two or three weeks. Some of the equipment is frequency dependent so this will be two weeks after the frequency is known. We highly suggest the frequency be determined as soon as possible and be between 450 and 470 MHz. We see no issue with meeting the timeline of the end of November for the conversion and first 10 boxes, if the frequency is available in time. If the frequency was available September 1 we could likely finish in October.

E. Bids Due

Our estimates will be mailed on August 3rd. We will also email a copy on August 6th so you can easily share it with all relevant parties.

F. Questions

We appreciated the prompt responses to the questions we sent. We are happy to answer questions you have in return. We can also make ourselves available to meet in person or remotely.

G. Warranty

A two-year warranty is provided. Some of the equipment has longer warranties.

H. Service

Protection Professionals is about an hour and fifteen minutes drive away from Waterville at our business in Falmouth. We rotate through an emergency on call technician pool, that range between a forty five minute to an hour and a half drive from Waterville, for after hour services. Some service can be done remotely. We also have relationships with Electrical companies in Waterville and Winslow who could take care of some issues with our remote assistance.

I. Equivalency

Protection Professionals is not a Digitize dealer and will therefore not be offering the System 3505 Prism Lx. We offer the WARN system instead. We believe it is equivalent in that it can meet your needs in receiving the existing and new alarm boxes and acting as a server for the Dispatch consoles. We can provide video examples of the software in action. Also, a live demonstration can be scheduled at a Fire Department where we have installed the WARN system.

J. Price

We have gotten quotes from our suppliers based on a September 1st awarding of the job. We will be ordering all equipment at that time and can therefor guaranty the Price. We will also not raise our labor rate for the duration of the project.

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Falmouth Maine 04105

Customer Estimate

Date	Estimate #
7/28/2020	883
Rep	JJL

Name / Address	Project
City of Waterville **Attn: Accounts Payable** **1 Common Street** **Waterville, ME 04901**	

Qty	Item	Description
		The following estimate is for the upgrade of the existing fire alarm DIGITIZE receiver and call boxes for the Waterville Fire Department in Waterville, Maine. The new system will allow for both wireless and 100 milliamp wired mechanical masterboxes to be received. The existing mechanical masterbox system will also resound the box numbers in the station and the new system shall be capable of this feature if needed. A stand-alone system will be installed at the Waterville Fire Department (WFD) located at 7 College Ave, Waterville Maine. A second stand-alone system will be installed at the Waterville Police Department (WPD) located a 10 Colby Street, Waterville Maine. Server and work stations do not include monitor, keyboard or Mouse. After 1 year annual software support $3,995 (2) servers (3) workstations Price includes 1 year of software support and updates 2 year warranty on hardware Black Box SW1041A Cat6 A/B Switch Latching Ethernet, Rs232 will be provided for the system to allow for remote programming, updates and support. This switch allows the end user to regulate access to the network prior to updates and services.
1	COM-EAS-PC1-1.MCP	Alarm Automation PC 19 Rack Mount, Black Intel Core 2 Serial Ports, 1TB Hard Drive, Windows 10 Pro, Dual PS, MCP Coder
1	COM-EAS-PC1-1.0	Alarm Automation PC, 19 Rack 2U Mounting, Black, Intel, 2 Serial Ports, 500GB SSD, Windows 10 Pro, No MCP
2	COM-EAS-WARN-SR...	WARN System Server Software
3	COM-EAS-WS1	WARN Workstation only (Shuttle Style)
3	COM-EAS-WARN-CL...	WARN Client software license (per workstation)
1	Misc Inventory Materials	AES Propagation Study
1	7705II	7705II Dual UL Multinet 1.1 RCVR Sys
2	7170	AES 7170 Remote IP Link Receiver
2	13-0345-100	Cable Assembly 100Ft, RG-8, N Male-X
2	7210-6-UC	AES 6B Omni Dir, High Gain, FB Mast, In/Outdoor, 4.5 ft, UHF Antenna
2	7230	Surge Suppressor
1	TC-SRCABL1U	1U Horizontal Cable Manager (Ring)
1	ZG-D10PFP	10 Outlet Rack Strip (no surge)
2	R1-PRO1500R2	Pro-Rt 1500va/1050w Line Interactive Ups
1	NO-HPM8915	8 Space Hpm With Adjustable Depth From 9'-15'
1	NO-CN103250	CN1032-50 - rack nuts
1	NO-HP	10/32 Screws with Washers 100-pack
1	Submittal Copies/Supp...	Purchases related to submittal packages

Total

Signature

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City of Waterville **Attn: Accounts Payable** **1 Common Street** **Waterville, ME 04901**	

Qty	Item	Description
1	Misc Inventory Materials	Black Box SW1041A Cat6 A/B Switch Latching Ethernet, Rs232 (for remote programming and software updates)
1	Misc Non-Inventory M...	Miscellaneous Materials
1	Shipping Income	Shipping Charge to Customer
1	Truck Non-Taxable	Truck Usage Charge
1	Final Test	Final Testing, Panel Terminations and Certification
		Please note the following: 1. All internal IT cabling, including CAT5e and fiber optic cable, and network Ethernet switches will be supplied by the customer and are not included in this estimate. 2. Do not install any electronic devices in unheated spaces please. 3. All tower work including aperture arms, fasteners and conduit will be supplied by others and is not included in this estimate. 4. Any requirements for stamped floor plans by an engineer shall be supplied by others. 5. All 120 VAC devices are supplied by others. 6. For the submittal package: we will supply sales sheets for all products, matrix, technical and end user training manuals. All other documents shall be supplied by others. All delegated design documents and floor plans are supplied by others. 7. The software product provided in this estimate is provided as is and with all faults. Protection Professionals makes no representations or warranties of any kind concerning the safety, suitability, lack of viruses, inaccuracies, typographical errors, or other harmful components of the software product provided in this estimate. There are inherent dangers in the use of any software, and you are responsible for determining whether this software product is compatible with your equipment as well as other software installed on the relevant computer. You are also solely responsible for the protection of your equipment (including virus protection) and back up of your data. Protection Professionals will not be liable for any damages you may suffer in connection with the installation, using, modifying, or distributing the software supplied with this estimate. 8. Unforeseen conditions may change the materials and labor used to complete this job. If they do additional costs may occur on a time & materials basis above the estimated cost.

Total **$67,142.52**

Signature _____

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Customer Estimate

Date	Estimate #
7/31/2020	888
Rep	JJL

Name / Address	Project
City of Waterville **Attn: Accounts Payable** **1 Common Street** **Waterville, ME 04901**	

Qty	Item	Description
		The following estimate is for volume discounted AES subscriber units. This price is for each subscriber unit installed and includes all parts, labor testing and miscellaneous material for up to eight existing Digitize zones. . Any programming, additional parts and labor to any existing converted fire alarm system will require a revised estimate per site. Protection Professionals will not be responsible for any patching, painting or repairs to existing masterbox to AES conversions. Base Bid for Standard AES Radio Masterbox with supplied Antenna
1	7707P-88-M	IntelliNet 2.0 Fire Subscriber, 8 Zone with integrated onboard Local Annunciator.
1	D8004	Transformer Enclosure
1	ELK-TRG1640	Plug in transformer 16 Volts, 45 VA output
1	77-FACPA	AES Isolator
1	Battery 12-12	Backup Battery 12V 12AH SLA-1105
1	Misc Non-Inventory M...	Miscellaneous Materials
1	EAS-SOFTWARELIC	WARN Radio License
1	Truck Non-Taxable	Truck Usage Charge
1	Shipping Income	Shipping Charge to Customer
1	Regular Labor / Service	Service Labor, Normal Working Hours
		Subtotal $2,694.11 Per Installation Unforeseen conditions may change the materials and labor used to complete this job. If they do additional costs may occur on a time & materials basis above the estimated cost.

Total **$2,694.11**

Signature _____

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Customer Estimate

Date	Estimate #
7/31/2020	889
Rep	JJL

Name / Address	Project
City of Waterville **Attn: Accounts Payable** **1 Common Street** **Waterville, ME 04901**	

Qty	Item	Description
		The following estimate is for volume discounted AES subscriber units. This price is for each subscriber unit installed and includes all parts, labor testing and miscellaneous material for up to eight existing Digitize zones. . Any programming, additional parts and labor to any existing converted fire alarm system will require a revised estimate per site. Protection Professionals will not be responsible for any patching, painting or repairs to existing masterbox to AES conversions.
		Base Bid for AES Radio Masterbox installation with external 6db antenna
1	7707P-88-M	IntelliNet 2.0 Fire Subscriber, 8 Zone with integrated onboard Local Annunciator.
1	D8004	Transformer Enclosure
1	ELK-TRG1640	Plug in transformer 16 Volts, 45 VA output
1	7230	Surge Suppressor
1	77-FACPA	AES Isolator
1	Battery 12-12	Backup Battery 12V 12AH SLA-1105
1	7210-6-UC	AES 6B Omni Dir, High Gain, FB Mast, In/Outdoor, 4.5 ft, UHF Antenna
1	Misc Non-Inventory M...	Miscellaneous Materials
1	EAS-SOFTWARELIC	WARN Radio License
1	Truck Non-Taxable	Truck Usage Charge
1	Shipping Income	Shipping Charge to Customer
1	Regular Labor / Service	Service Labor, Normal Working Hours
		Subtotal $3401.71
		Unforeseen conditions may change the materials and labor used to complete this job. If they do additional costs may occur on a time & materials basis above the estimated cost.

Total **$3,401.71**

Signature _____

E2010 MCP
Municipal Circuit Processor 100 mil Circuit Encode/Decoder Module

The E2010 MCP by Easton Electronics is an advanced microprocessor-based unit designed to provide many years of reliable signal processing. The MCP's primary function is to provide a stable and reliable Duplex interface between existing telegraph based municipal fire alarm reporting circuits, wireless alarm reporting and alarm automation. The E2010 MCP provides a **seamless interface** between these very different technologies.

Shown installed in drive bays with locking access door open

When utilized as part of the WARN Alarm Automation package the E2010 MCP functions automatically without the need for user intervention. The unit is fully automated and requires no user attention unless an abnormal condition is detected by the unit and indicated via the unit's onboard sounder, LCD display, LEDs and WARN workstations.

The MCP is designed to interface with the WARN Alarm Automation Server software. The WARN Client software, which runs on each individual workstation, continuously monitors the WARN Server displaying any new signals received as well as system status. Workstation users can additionally send manual signals to the MCP to perform manual signaling of the connected 100mil circuit to signal house bells and related connected devices.

The MCP constantly monitors the municipal circuit. It immediately displays any signals or trouble conditions detected and passes all signals to the WARN Automation Server for logging and display on all connected WARN workstations.

The MCP also provides the option to signal the house bells with an alarm signal received from digital communicators such as an AES radio. When an alarm signal is received from a communicator such as an AES radio the WARN alarm automation system can send the MCP the account number of the radio received; the MCP then in turn converts this to a telegraph format and sends the signal back out to the 100mil municipal circuit. This allows the telegraph system to signal the radio number which has sent in an alarm in the same manner that traditional telegraph boxes do thereby providing an audible coded signal alerting all those concerned of the actual radio sending an alarm.

The MCP also provides an additional layer of total system supervision via loop-back test signals sent throughout the internal system communication paths assuring that all software and hardware is functioning properly. If a failure is detected the MCP sounds it's onboard audible alert tone and displays the condition on its LCD & LED displays as well as on the WARN Server and WARN workstations.

Easton Life Safety Systems Electronics Inc.

80 Cedar St. Suite 2 Canton, Ma.
02021 Phone (800) 879-3117
Fax (781) 828-3719
www.easton-electronics.com

Specifications

Telegraphic E2010 MCP Encoder/Decoder

Power: built in 110vac line cord (for Alarm Automation).
12vdc External plug in PS (for MCP)
Mounting: Housed in alarm automation computer unit
Standard case dimensions: 4U size

Decoding
- Incoming Timing: self adjusting 1/4 sec to 2 sec
- Compensation: Automatic for speed changes during incoming rounds
- Circuit Supervision: Monitors the connection to the form 4 circuit

Encoding
- Timing: 1/4 to 2 sec adjustable
- Number of rounds: 1-4 adjustable
- PNI monitoring: always active

LED Indicators
- System Trouble
- Remote Terminal Fail
- City Circuit Trouble
- System Test Active/Fail
- Radio Test Fail
- Radio Coder Output Status
- City Circuit Input Status
- Power

Controls
- Acknowledgement
- Reset
- System Function
- Select
- Next

Audible
- Buzzer Solid State

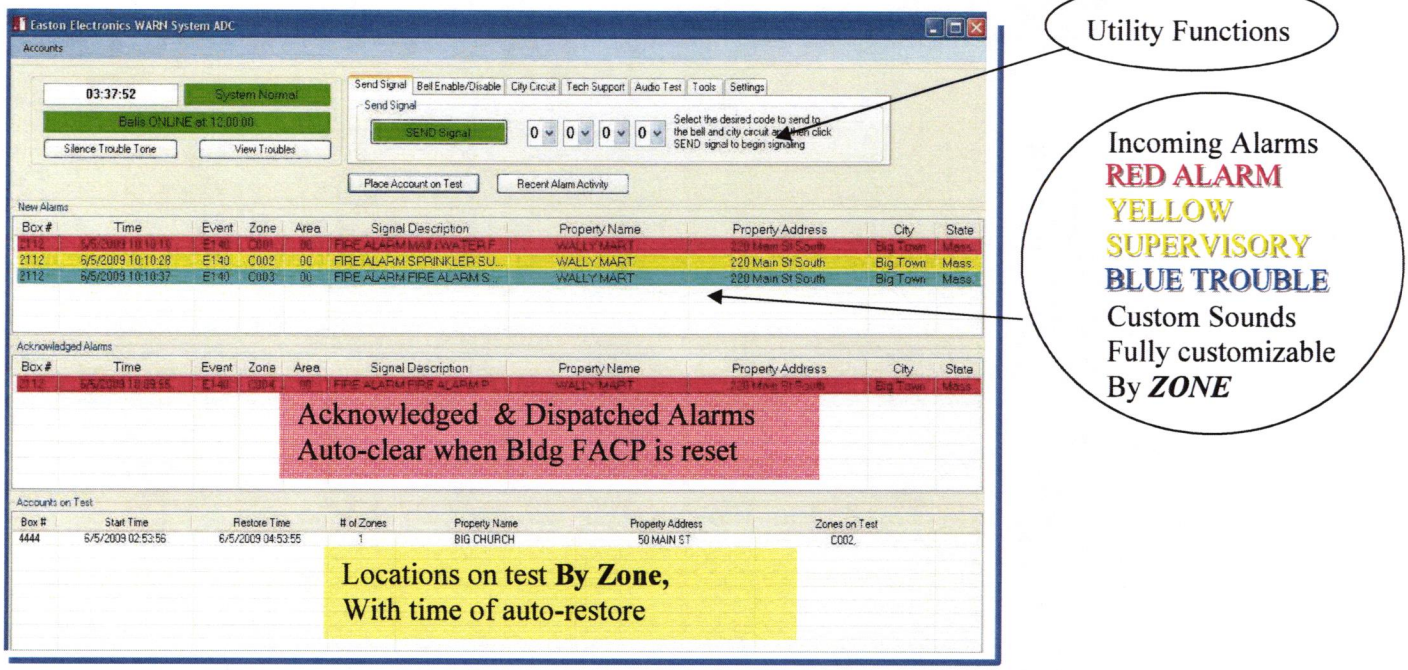
Display
- 2 Line ¼" LCD

Connections
- VGA
- Low level Audio

12vdc: 250ma
City: Form 4 circuit
Relay1: Form C Coded (1A@30vdc)
Relay2: Form A Aux Programmable (5A @ 30vdc)
Aux: Aux Control Input (accepts contact closure only)
Operating Temperature: 55F to 100F

W.A.R.N. Alarm and Dispatch Software

Designed for Municipal Fire Service



NFPA 1221 Compliant Connectivity

Features:

Regional Dispatch Compatible

Multi-color Display:
You can now assign identifying colors (Red, Yellow or Blue) to incoming signals by zone and signal type so that they are displayed on-screen in the assigned color (i.e. a different color for Alarm, Trouble, Supervisory, Security, etc. per zone).

Multi-Sound:
You can now assign unique sounds to incoming signals by zone and signal type (i.e. a different sound for Alarm, Trouble, Supervisory, Security, etc. per zone). Select from 4 different standard sounds, plus custom tones.

Place Individual Zones on Test:
Put individual reporting zones on test, even by device, as opposed to the entire account

Easy Account Management:
Simplified procedure to add and edit accounts

History-Log View and Printing Simplified:
Easy-to-read and detailed complete event history.

Connectivity Compatibility:
Compatible with most major manufacturers of fire alarm radio receivers, Form 4 telegraph systems (single or duplex) and Dial up communicators, as well as IP Based Network Reporting Systems.

More W.A.R.N. Features

Auto Complete Acknowledged Alarms:
When this feature is enabled, alarms that have been acknowledged by the dispatcher will automatically clear off the screen once a restore has been sent from the monitored fire alarm system. This feature allows indication of the restore status of radios in real-time. When an alarm is received, the dispatcher acknowledges the alarm as usual and the alarm is then moved to the acknowledged alarm list. Once the fire alarm has been reset at the property, the acknowledged alarm will automatically clear off the screen. All activity is logged in the history file for that account as usual for future reference. The history event will indicate that the alarm was auto-completed.

Disable Manual Alarm Complete Button:
When this feature is enabled, the 'Complete' button on the alarm response window is disabled. This feature is useful when it is desired to allow the dispatcher to acknowledge alarms, but not complete them and clear them off the screen. This feature is best used when the 'Auto Complete Acknowledged Alarms' feature is enabled.

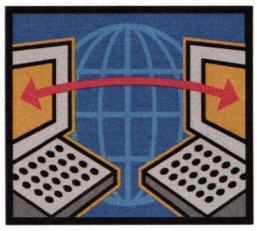
Display All Recent Alarm Activity (not account specific):
The dispatcher can now review the last 200 alarms received with a simple click of the new 'Recent Alarm Activity' button on the main dispatch screen. Once clicked, a list of the last 200 alarms received will be displayed, starting with the most recent. This feature is useful as a quick reference when it is desired to see all alarm activity (not just activity specific to one account as has always been available in account history). This feature is also useful for situations when it is desired to see what the last alarm was if it was accidentally completed and cleared off the screen before it should have been.

Auto Complete Prior Alarms when originating alarm is completed:
When this feature is enabled, completion of an acknowledged alarm event (either automatically by auto complete or manually by the dispatcher) will automatically complete any prior related existing acknowledged alarm events. This simplifies the completion of an alarm event by clearing off multiple events related to the original alarm with one action.

Remote Access:
Allows field personnel to view and control system events for building inspections

Remote Notification:
Auto Remote notification, customized by zone – for example, the system can send an email and/or text message to a specified person or group of people depending on what zone/event has been activated.

On Screen Technical Support
Technical support can now be requested without having to pick up the phone. Simply click the on-screen technical support button, enter your name and click send. A technical support request will then be immediately sent to the on-call technician via text message. This feature is available 24/7/365. Each request is logged to a local history log for future reference if desired.



Tech Support Request Active Indicator:
When a tech support request is initiated on screen by the dispatcher, the workstation that initiated the tech support request will now display an indicator as being the requesting station. This aids the responding technician in knowing which dispatcher was looking for assistance.

Remote data back up:
All system data is automatically backed up off site

Wireless communications:
Wireless control provides remote functions such as gongs/lights in substations, and dispatch/annunciator locations.

Windows 32 bit based (Windows 10 recommended for server and clients)

Up to 10 dispatch workstations

Unlimited history database

Partitioning
Includes partitioning option to allow control of which signal events display on each dispatch workstation. Signal display can be controlled by account or by specific signal event.

Multiple event colors and sounds
Each event can be configured to display in one of (6) colors and a choice of (4) different audible sounds

Auto complete and auto restore
Events can be configured to auto acknowledge upon receipt and auto complete upon restore if desired.

Flexible test options
Events can be placed on test by zone, point or account and on permanent or timed test. Accounts, zone, points on timed test automatically restore to normal operation at the time selected when placed on test.

Automatic data backup
All data is backed up automatically every 24 hours to our servers for data recovery if necessary.

Flexible on-screen soft keys
10 on screens buttons to be configured for various manually signaling options such group texting of on-call staff, manual activation of house bells and more.

TCP/IP relay control
Up to 20 remote dry contact IP relays can be manually activated or automatically activated with select events for control of lights, signals and much more.

Dispatcher comments
Dispatcher can add comments to each signal received which are stored in the history of the related account

CAD output
Built in CAD output to interface with IMC CAD software

Dual network capable
Client workstations include the option to use dual network paths back to the server for NFPA 1221 connectivity.

Designed for Fire Departments
The WARN System was built from the ground up for fire department usage. Typical alarm automation includes many features never utilized by fire departments increasing cost and complexity. The WARN system is designed to be extremely user friendly and to only include what fire departments need.

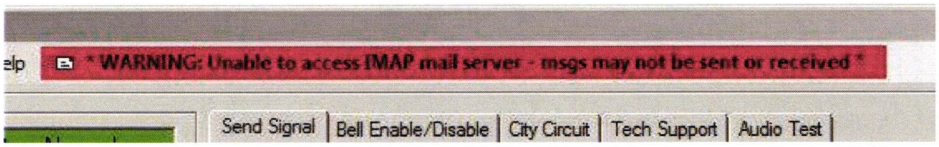
Detailed reporting
Display or email reports detailing account history, account configuration, signal activity and more.

User control
Limit access to account editing with dedicated user groups

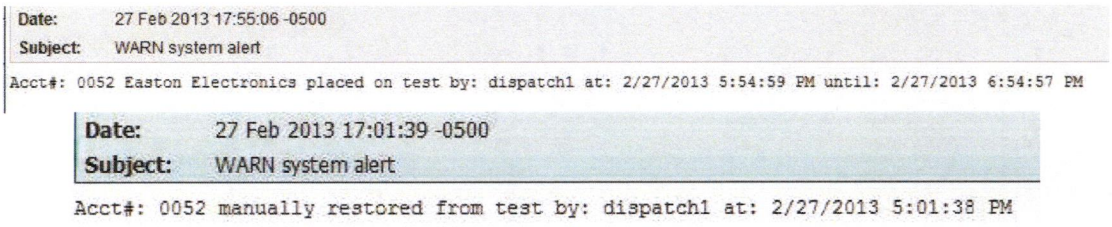
Version 4 enhancements:

Email & text messaging:

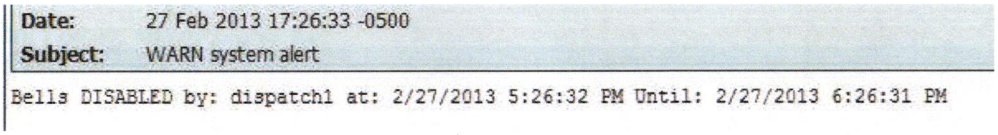
- **EMAIL SERVER MONITORING:** To help assure that emails and text messages can be delivered by the system all dispatch workstations and the WARN server now constantly monitor their connection to their assigned email server. By constantly monitoring the email server, problems with email can be detected before the system actually needs to send an email preventing the possible loss of crucial email or text message alerts. If a workstation detects that it can no longer communicate with the email server it will display an error at the top of the dispatch screen. If the server detects a failure of its assigned email server a trouble signal is displayed on all workstations.



- **SEND EMAIL/TEXT MESSAGE WHEN ACCOUNT IS PLACED ON OR REMOVED FROM TEST:** Receive text and email messages whenever an account is placed on test, or removed from test manually or automatically after test timeout.

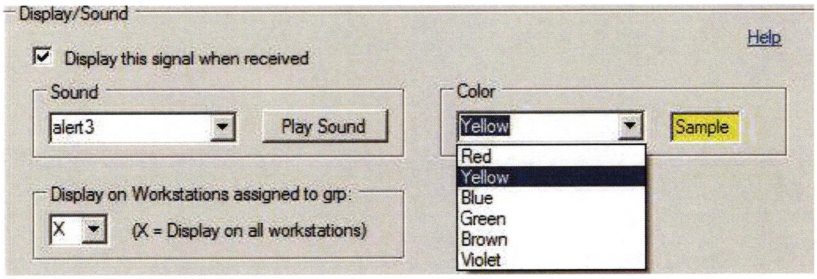


- **SEND EMAIL/TEXT MESSAGE WHEN BELLS ARE DISABLED OR ENABLED**

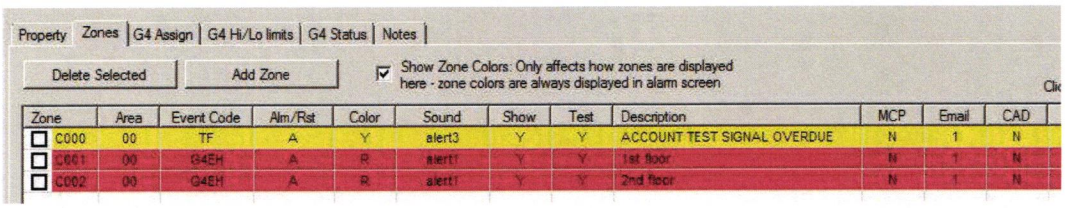


Signal display and account editing:

- **3 NEW SIGNAL/ZONE COLORS:** Alarms now can be programmed to display as green, brown or violet in addition to the original red, yellow or blue. A sample display is now included in the zone editor to demonstrate how the signal will appear with the selected color.



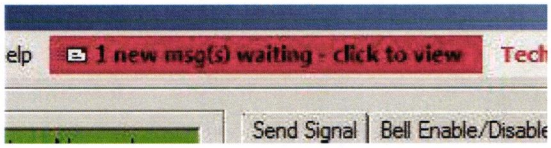
- **ZONE COLOR DISPLAY:** When viewing the list of zones in the account edit screen the zones are now displayed in the color they are set to display as, making it very easy to see how each zone will display in an alarm condition.



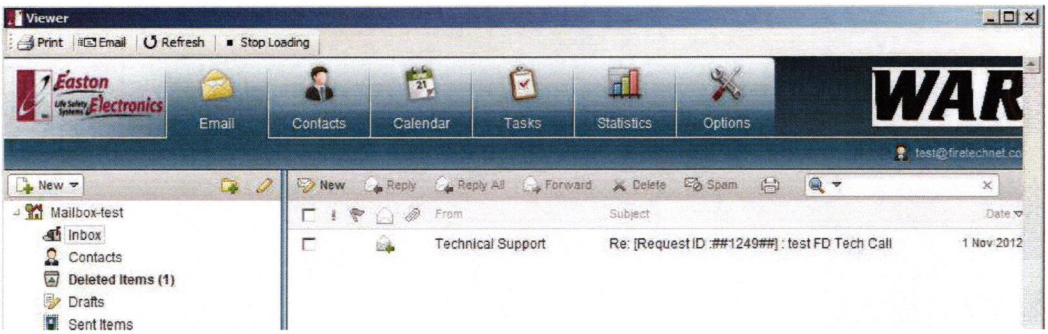
- **ZONE DATA SORTING:** When viewing the zone list in the account edit screen the user can click on the column header to sort the zones by that column. i.e.: clicking the zone number column sorts the zones by zone number, clicking the description column sorts the zones by description, etc.

Technical Support System:

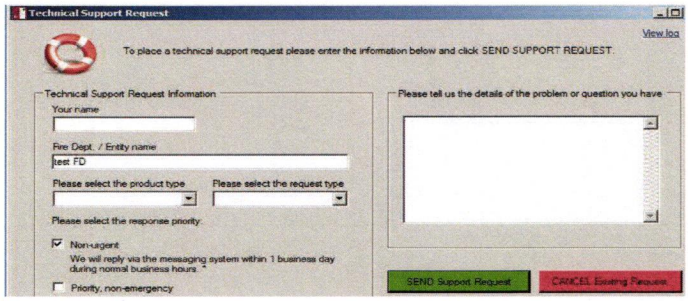
- **BUILT IN TECHNICAL SUPPORT MESSAGING SYSTEM:** Users can now receive messages from Easton Electronics technicians right at the dispatch workstation in addition to the already available ability to send support requests. After sending a technical support request an indicator will flash at the top of the dispatch screen when a technician has responded to the request.



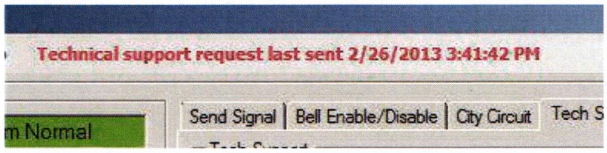
The user then simply clicks on the flashing indicator and the response is displayed allowing the user to view the response and reply to it if desired.



- **IMPROVED TECHNICAL REQUEST FORM:** Users can provide greater detail in regards to the support request, greatly assisting the responding technician in providing the most effective response.



- **IMPROVED TECHNICAL SUPPORT INDICATOR:** The technical support request indicator which displays on the top of the dispatch screen now displays when the request was sent.



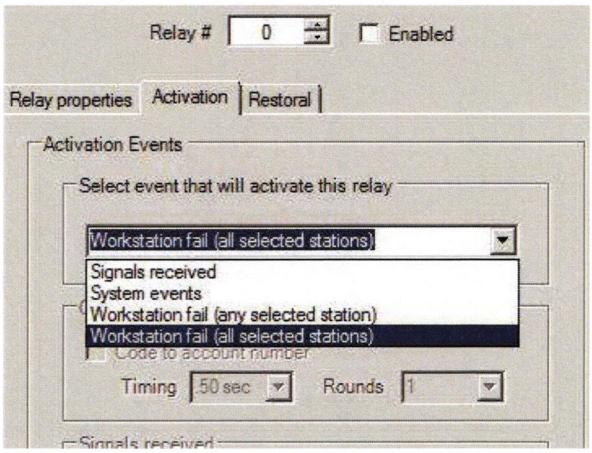
Logging:

- **WORKSTATION ID IN HISTORY LOG:** When a signal is acknowledged or completed or when account changes are saved, the ID of the dispatch workstation is now recorded in the history log along with the event providing a history log of which workstation performed the operation and when.

Time	Event Type	Action	Evt Code
2/26/2013 3:26:21 PM	Prior Alarm	User Acknowledged by: dispatch1	P370

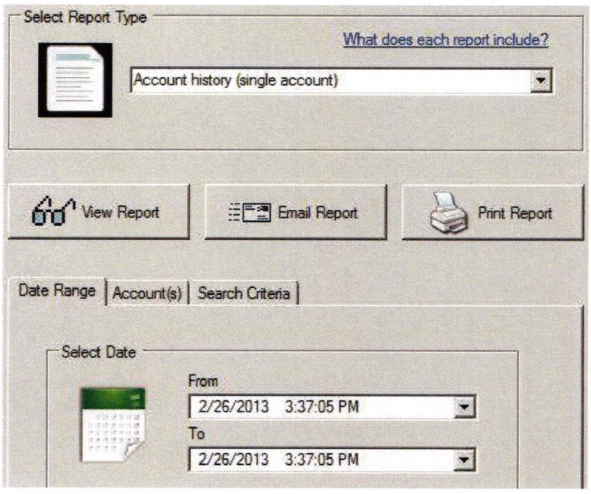
Outputs:

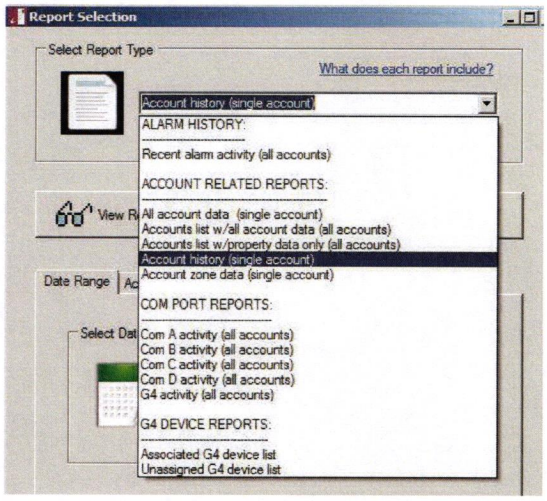
- **TCP/IP OUTPUT RELAYS**: Up to 20 relay modules can be installed anywhere a TCP/IP network is available (local network or the internet) and can be programmed to activate upon: **a workstation failure, when new signals are received, a system trouble occurs, when manual buttons are clicked by the user at any dispatch screen or when the system bells are disabled** allowing for control of devices, signals, equipment, entry points and much more practically anywhere.



Reports:

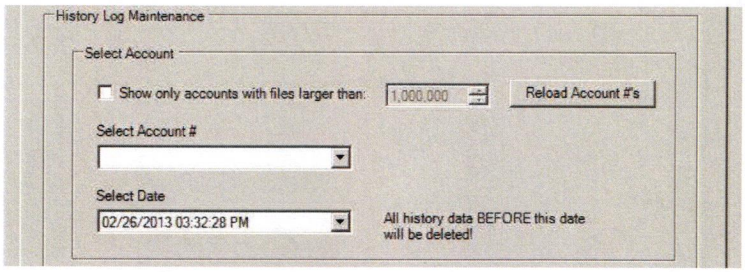
- **IMPROVED REPORT INTERFACE:** Simplified user interface when selecting report criteria
- **NEW REPORTS:** Zone programming list, G4 device reports and more
- **EMAIL REPORTS:** Reports can now be emailed right from the dispatch screen





File maintenance:

- **DELETE OLD FILES:** Ability to delete old history files if desired



AES CORPORATION 40 Years of SECURITY INNOVATION

aes-corp.com

No More Boundaries

7170 Remote IP Link Receiver

Technical Specifications

DIMENSIONS
NEMA4 Enclosure
15 in H x 13 in W x 7 in D
(38.1 cm H x 33.02 cm W
x 17.78 cm D)

WEIGHT
8.2 lb, 3.7 kg

POWER SUPPLY
110V

ETHERNET CONNECTION
RJ45
Connection - RJ11
Telephone Line Connection

BATTERY BACKUP
12V 10A HR Battery

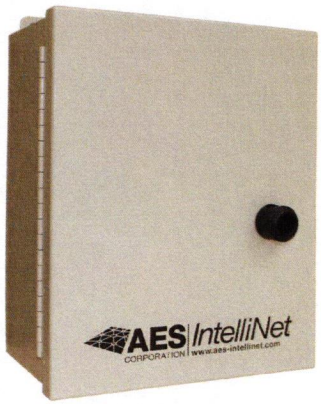
OPERATING TEMPERATURE
0° to 50° C (32° to 122° F)

NETWORK CONNECTIVITY
TCP/IP Network

RF OPERATING FREQUENCY OPTIONS
UHF - 400-512 MHz
VHF - 150-174 MHz
Others Available

UL LISTINGS
UL 864 - Edition 9
UL 2050
UL 1610
UL 365

NFPA-72 COMPLIANT

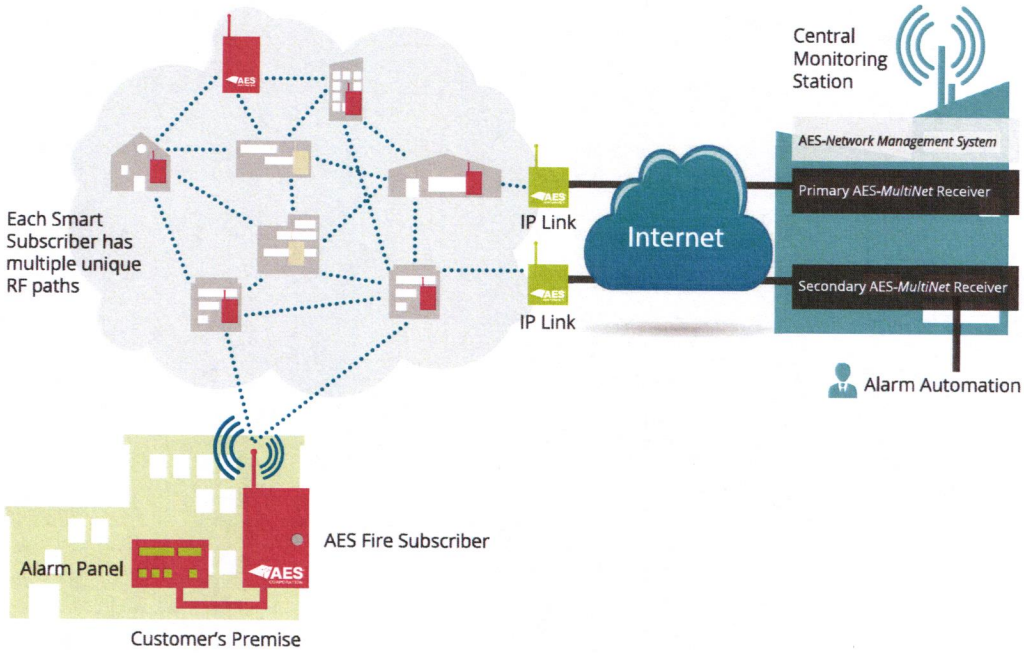


Features

- Connect Multiple AES-*IntelliNet* Networks
- Expand AES-*IntelliNet* Wireless Network Capacity
- Wireless-to-Internet Alarm Transmission
- UL Listed
- NFPA-72 Compliant

Wireless mesh networking is an innovative technology adopted by many industries with applications that need to communicate data over a large geographic area with a high level of reliability at a low Total Cost of Ownership (TCO).

The advanced design and 2-way communications capability provides easy installation, expansion, and management when compared to alternative communication methods, both wired and wireless.



HOW TO ORDER

Model	Description
7170-EM(UL)	UL Listed Remote IP Link Receiver

About AES Corporation

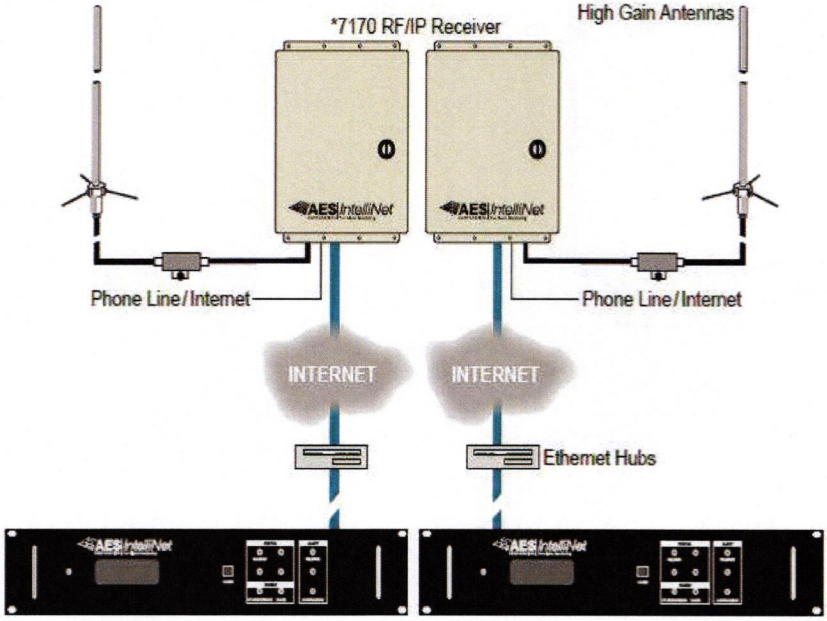
AES Corporation is the leading manufacturer of code compliant wireless alarm communication products and solutions serving commercial security markets and government agencies worldwide.

AES-*IntelliNet*® patented technology will never sunset compared to obsoleting technologies such as cellular and traditional phone lines. AES private mesh radio networks are owner operated and controlled, providing infinite scalability and superior reliability with the fastest transmission speed available. Over a half million AES Smart Subscribers are installed worldwide. AES is the clear choice for life safety and security, protecting people and property for over 40 years.

Connects Multiple AES-*IntelliNet*® Radio Networks

A major component of the AES-*MultiNet* Transceiver System, the 7170 RF/IP Transceiver connects AES-*IntelliNet* radio networks to AES-*MultiNet* 7005i/ 7705i Servers, via the Internet. Adding AES 7170 Remote RF/IP Transceiver allows central stations to monitor one or more AES-*MultiNet* Radio networks from a single location anywhere on the globe!

- UL Listed and NFPA-72 compliant (2 AES 7170 Remote RF/IP Transceivers required by UL)
- Operator-owned network
- No monthly fees
- Universally expandable
- Full data or discreet zoning



No More Boundaries

- Multi-region fire and security wireless alarm communications anywhere
- Large regional users of AES-*IntelliNet* networks can use the AES-*MultiNet* system to increase coverage

For more information, go to **www.aes-corp.com** or call **(800) 237-6387** or contact us at **sales@aes-corp.com**

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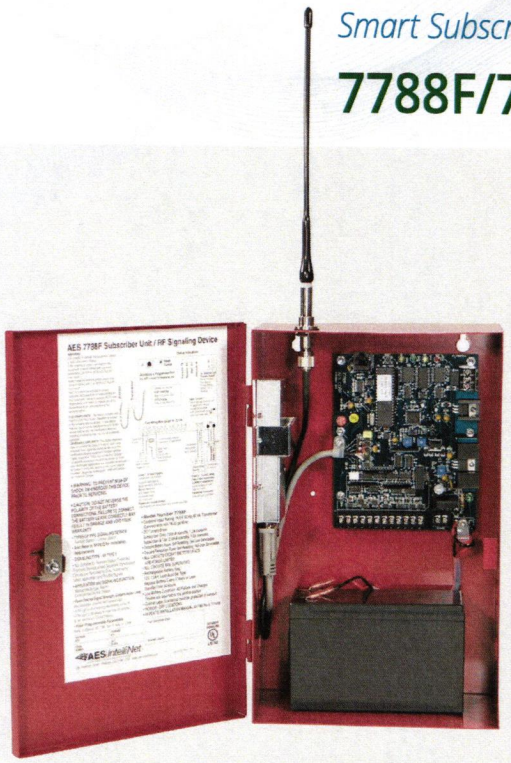
Smart Subscribers for Commercial Fire Alarm Systems

7788F/7744F Series Fire Subscribers



Features

- AES-*IntelliNet*® smart mesh radio networks are self-forming, self-healing, and highly scalable
- AES-*IntelliNet* alarm communications technology never sunsets compared to cellular alternatives
- Each Smart Subscriber enables multiple paths to a central monitoring station
- Option to transmit full data from FACP digital dialer to AES-*MultiNet* receiver
- Simple and fast activation on AES-*IntelliNet* network

Benefits

- Most stable and profitable fire alarm communication technology
- Network owner-operators retain virtually all RMR
- Meets UL 864 Commercial Fire Alarm requirements for primary standalone communication
- Ideal drop-in full-function replacement for phone lines
- Universal wireless Smart Subscriber Transceivers support all new and legacy FACPs

Advanced Wireless Fire Alarm Monitoring

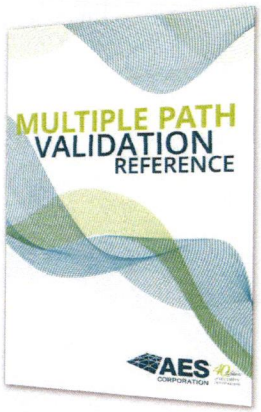
AES 7788F/7744F Series Subscribers are the ideal universal wireless communicators for any new or existing fire alarm system. AES-*IntelliNet* networks are built using AES Corporation's patented mesh radio communications technology. A Smart Subscriber at each alarm site acts as transmitter, receiver, and repeater of alarm signals across the network. This creates a smart long-range radio network with multiple pathways between each alarm site and the central receiver. Multiple pathways mean multiple redundancies assuring the most reliable delivery of signals and compliance with rigorous industry standards. AES-*IntelliNet* networks self-adjust to network changes and assure that signals automatically follow the shortest path available as the network of Subscribers grows.

Highest Long Term Stability and Profitability

AES-*IntelliNet* remains the most stable and profitable fire alarm communication technology available today in the rapidly changing world of communications. AES private wireless networks never sunset compared to cellular technology and traditional phone lines. AES-*IntelliNet* networks maximize RMR generated from network alarm communication services because signals are delivered without the need for a costly operations center or cellular service providers.

UL 864 Edition 9 Compliant – Primary Standalone Communicators

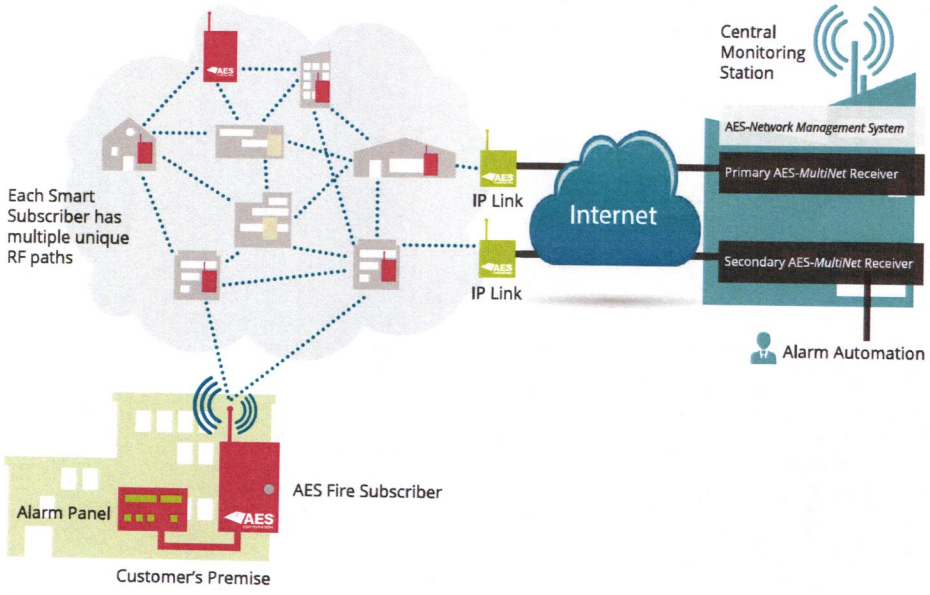
In order to meet UL approval and NFPA compliance, most fire alarm communicators require either a second communication technology or a costly service plan included with sole path cellular alternatives. With AES-*IntelliNet* alarm communications technology, each standalone AES 7788F/7744F Subscriber provides multiple RF pathways across the mesh radio network to the central monitoring station. To meet compliance standards, only 2 RF paths are required. Please refer to the official NFPA 72 National Fire Alarm and Signaling Code handbook, Chapter 26 (26.6.3.3.2 One-Way Private Radio Alarm Systems/Technology Reference Comparison Table A.26.6.1).



Multiple RF Path Reference Guide

AES provides a *Multiple Path Validation Reference* guide detailing how to easily validate multiple RF paths at each AES 7788F/7744F Series Fire Subscriber. The guide also provides a complete listing of the codes and standards to which AES-*IntelliNet* products have been tested. To assist Authorities Having Jurisdiction (AHJs) with the fire alarm inspection process, the guide and other valuable installer tools are available for download from the company website. Visit our Fire Marshal Resources page at (http://www.aes-intellinet.com/products/fire/fire-marshal-resources/).

AES-*IntelliNet*® Private Wireless Mesh Network



Each Smart Subscriber acts as transmitter, receiver, and repeater creating a smart long-range radio network with multiple pathways and multiple redundancies. The AES-*IntelliNet* network is self-forming, self-healing, highly scalable and assures that signals follow the shortest path available as the network expands.

Cost Free Supervised Operation

AES Subscribers offer fully-supervised operation that includes monitoring of primary and back-up operating power as well as the radio connection to the AES-*IntelliNet* network. Each Subscriber performs "Check-ins" with the AES central station receiver at least once every 24 hours which complies with the UL 864 standard for commercial fire alarm communications. The supervision Check-in time can be set to as often as needed for the application. Because the central station owns and operates the long-range wireless network, there is no cost for air time to transmit supervisory signals. This is very different from cellular alternatives which require an aggressive supervision Check-in schedule in order to comply with UL 864 listing. The high monthly cost for cellular service fees significantly reduce RMR profit.

> Unlike cellular, there is no cost for air time to transmit supervisory signals.

Full Data Module Option - Ideal replacement for Phone Lines

AES Subscribers transmit consolidated alarm, trouble, and supervisory signals triggered by a FACP output relay. Subscribers with an integrated AES-*IntelliPro* Fire full data module transmit full alarm zone and event codes captured from a panel's digital communicator. Both options individually meet UL and NFPA 72 requirements. AES Fire Subscribers with built-in full data module are the ideal drop-in full-function replacement for phone lines for communicating signals from both new and existing UL commercial fire alarm systems. Replacing phone lines with AES-*IntelliNet* maximizes RMR profit with significant bottom line impact, unlike with cellular technologies that charge high monthly service fees.

How to Order

AES Fire Subscribers	
7788F	8 Zone Fire Subscriber, 8 Supervised Zones, Red Enclosure.
7744F	4x4 Zone Fire Subscriber, 4 Reversing Polarity, 4 Supervised Zones, Red Enclosure.
7788F-ULP	8 Zone Fire Subscriber, 8 Supervised Zones, includes 7794 AES-*IntelliPro* Fire, Red Enclosure.
7744F-ULP	4x4 Zone Fire Subscriber, 4 Reversing Polarity, 4 Supervised, includes 7794 AES-*IntelliPro* Fire, Red Enclosure.
7788F-ULP-P	8 Zone Fire Subscriber, 8 Supervised Zones, includes 7795 AES-*IntelliPro* Fire, Red Enclosure. UL listed for primary standalone communication with fire radios.
7744F-ULP-P	4x4 Zone Fire Subscriber, 4 Reversing Polarity, 4 Supervised Zones, includes 7795 AES-*IntelliPro* Fire, Red Enclosure. UL listed for primary standalone communication with fire radios.
7788F-C	8 Zone Fire Alarm Subscriber. ULC listed for Canada.
7788F-C-ULP	7788F-C Fire Alarm Subscriber with AES-*IntelliPro* Fire full data module. ULC listed for Canada.
Add-on AES-*IntelliPro* Fire Modules	
7794	AES-*IntelliPro* Fire Full Data Module. UL listed for supplemental communication with fire radios.
7795	AES-*IntelliPro* Fire Full Data Module (7794) with 7762 Hardware Supervisory Module and 7740 AES Local Annunciator. UL listed for primary standalone communication with fire radios.
7742	7762 Hardware Supervisory Module and 7740 AES Local Annunciator. 7762 module provides power and supervision of the 7740 AES Local Annunciator.
AES Local Annunciator	
7740	7740 AES Local Annunciator. UL listed for use with 7795 module or 7742 module.

Technical Specifications

7788F/7744F

Dimensions
- 13.25"H x 8.5"W x 4.3"D (34cm H x 21.5cm W x 11cm D)

Weight
- Approx. 7 pounds (3.2 kilograms), excludes battery

Radio Frequency
- Standard Frequency Range: 450-470MHz (others available in 400-512MHz range
- Output Power – 2 Watts and 5 Watts

Antenna
- Included 2.5 db tamper resistant antenna mounts on enclosure
- Multiple remote antenna options available

Power Input
- 16.5VAC, 40VA transformer (not included) (AES 1640, ELK TRG1640, MG Electronics MGT1640 – UL Listed for use)

Backup Battery
- Will charge 12V battery up to 7.5 - 12 AH,
- Requires 12VDC 7.5 AH battery for UL 864

Alarm Signal Inputs (subscriber)
- 7788F – 8 individually programmable zones
- 7744F – 4 individually programmable zones and 4 reverse polarity inputs

UL Standards
- UL 864 Edition 9 – Standard for Control Units and Accessories for Fire Alarm Systems
- UL 365 – Standard for Police Station Connected Burglary Alarm Units and Systems
- UL 1681 – Standard for Central Station Burglary Alarm Units

Antenna Cut/Communication Trouble Output
- Form C relay; fail secure; rated for 24 VDC 1A resistive

Reset Button
- Located on main circuit board

Operating Temperature
- 0° to 50° C (32° to 122°F)

Storage Temperature
- –10° to 60° C (14° to 140°F)

Relative Humidity
- 0 to 85% RHC, Non-Condensing

7794

- Transmits full data to AES-*MultiNet* receiver using Contact ID or Pulse formats
- Formats Supported: Contact ID, Pulse 3+1, Pulse 4+1, Pulse 4+2, Modem IIe, and Modem IIIa2

Input/Output Connections
- AES Subscriber – data and power
- Handheld/PC programming port
- Plain Old Telephone Service (POTS) incoming phone line
- Phone output connection from alarm panel
- Trouble output (form C relay)

Size
- 4.875" x 5" (12.3cm x 12.7cm)

Power Requirements
- 12 VDC nominal, primary and backup power provided by the AES RF Transceiver Unit

Current Consumption
- 350 mA nominal

7795

- P/N 40-7795 is a kit that includes 7794 module and 7762 Hardware Supervisory module. For 7794, please see Technical Specifications above

7762

- Hardware Supervisory Module

Input/Output Connections
- J1 - AES 7794 (J2) or Subscriber (J1) - data and power
- Input for Subscriber J4 Output
- Input for AES 7740 Local Annunciator - data and power
- AES 7740/AES 7794 Trouble Output to Subscriber input zone

Size
- 2.5" x 4.9375" (6.3cm x 12.5cm)

Power Input
- 12VDC nominal, power supplied from AES 7794 module or AES 7788F/7744F Subscribers

Current Consumption
- 40 mA average; 100 mA peak

Specifications Subject to Change Without Notice

About AES Corporation

Established in 1974, AES Corporation empowers companies to grow profitable alarm monitoring businesses, and government agencies to enhance security anywhere in the world. By providing the industry's only patented owner operated and controlled private wireless mesh networks, AES ensures superior reliability, low Total Cost of Ownership (TCO) and optimal Recurring Monthly Revenue (RMR) while reducing dependence on service provider infrastructures. The company's flagship AES-*IntelliNet*® systems are deployed in over a half million locations worldwide.

For more information, go to **www.aes-corp.com** or call **(800) 237-6387** or contact us at **sales@aes-corp.com**

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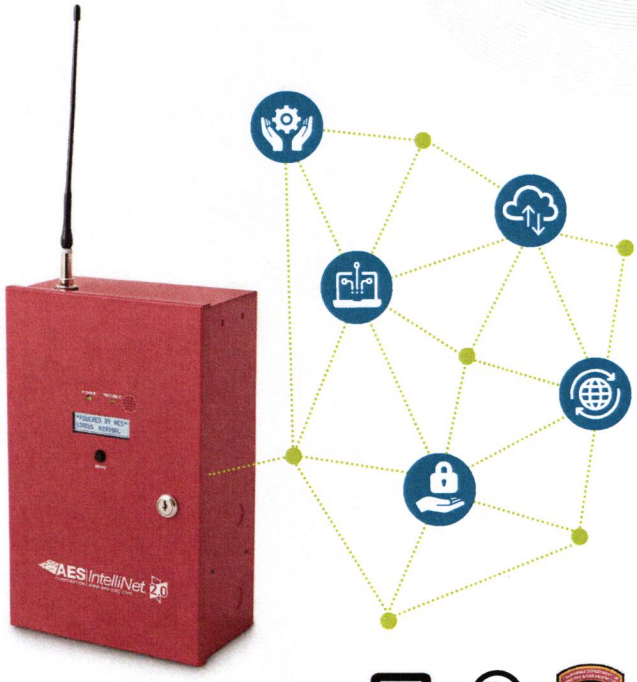
7707 Fire Subscribers

IntelliNet 2.0



A Newer, Smarter Alarm Communications Platform

Feature Highlights

- Leverages state of the art technology
- Applies advanced security protection
- Offers flexible power and configuration options
- Engineered for backward compatibility with legacy systems
- Enables future ready capabilities
- Provides instant subscriber status through front panel with Power and Trouble LEDs, a backlit LCD display, and Menu/Silence button
- Includes robust Multiple Communication Technologies (MCT) feature
- Emulates virtual keypad
- Improves functionality with an adaptive Graphic User Interface (GUI) for programming via smartphones, tablets and PCs
- Plus many more...

Key Benefits

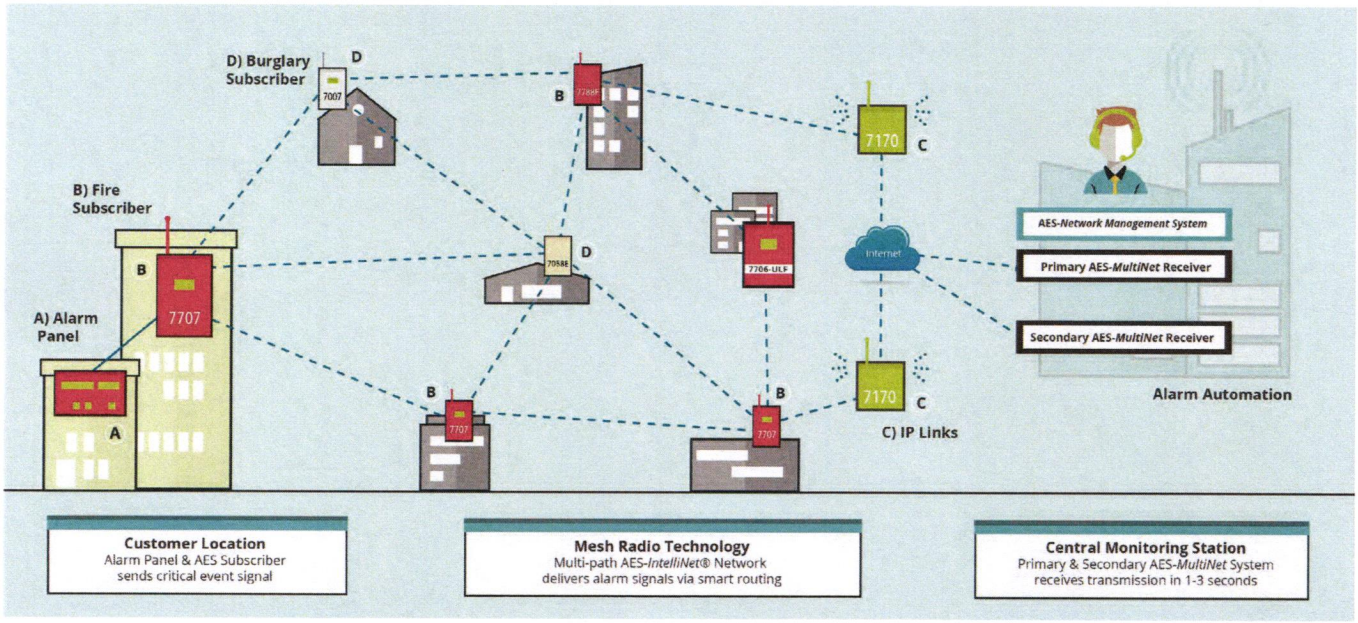
- Built upon the solid foundation of AES-*IntelliNet* patented mesh radio technology for use in private licensed wireless networks
- Protects subscriber units against unauthorized access and rogue activity with a password-protected Dealer Code
- Makes programming and streamlined troubleshooting easy with user friendly interface
- Adds integrated supervision of AES-*IntelliPro* full data module
- Provides versatile power options:
  (1) Direct from the Fire Alarm Control Panel (FACP) without requiring an electrician onsite and without Subscriber backup battery;
  (2) Directly from the FACP with Subscriber backup battery; or
  (3) Traditional installation with plug in Class 2 low power transformer
- Allows for enhancement upgrades and an expanded number of new features to be added easily with highly flexible and scalable alarm communications infrastructure
- Rigorously tested to the highest industry standards and future ready to meet emerging NFPA code and UL standards

Enhanced Wireless Fire Alarm Monitoring

Powered by AES enhanced mesh radio technology, *IntelliNet* 2.0 7707 Fire Subscribers are next generation universal wireless communicators that provide advanced security protection for any new or existing alarm monitoring network. The AES Model 7707 is ideal for commercial fire applications. With the AES-*IntelliPro* full data module option, they are the ideal drop-in replacement for Plain Old Telephone Service (POTS) lines.

The red metal enclosure comes with a key lock and front panel LCD backlit display with intuitive view that provides an instant visual of the subscriber status. The user friendly GUI makes it easy to program AES subscriber units via a smartphone, laptop, tablet, or integrated Universal Serial Bus (USB)—without the need for special cables or having to use a handheld programmer. Additional knockouts make it easier to mount for faster installation.

IntelliNet 2.0 Private Wireless Mesh Radio Network



The *IntelliNet* 2.0 Fire Subscriber has an 8 Zone modular design for expansion with normal and reverse polarity, POTS and DACT interfaces with an option for the 7794A AES-*IntelliPro* full data module add-on accessory board. AES subscribers' intelligent software automatically detects new hardware and devices to reduce installation time.

An AES certified WiFi accessory allows seamless wireless connectivity for configuration and programming. A laptop, Ethernet cable, or a Wi-Fi USB dongle is required for *IntelliNet* 2.0 programming, handheld programmers will not work with 2.0 units. A FACP Power Supply Adapter is required for certain configurations when using flexible power options. The forward compatible design allows for feature add-ons, engineered to adapt seamlessly with future software upgrades as technology advances. *IntelliNet* 2.0 allows configuration cloning for faster installation time.

The AES 7707 was designed with quick configuration and installation in mind to make it easier for field technicians to get in, out, and on to the next install.

Visit our Fire Marshal Resources web page for official NFPA and UL Listings:
aes-corp.com/products/fire/fire-marshal-resources

IntelliNet 2.0 Fire Subscribers	
2.0 PREMIUM (UL & ULC Listed)	
7707P-88-M	*IntelliNet* 2.0 Fire Subscriber, 8 Zone with Multiple Communication Technologies (MCT), Red Enclosure
7707P-88-ULP-M	*IntelliNet* 2.0 Fire Subscriber, 8 Zone with 7794A AES-*IntelliPro*, and integrated onboard Local Annunciator plus MCT, Red Enclosure
7707P-44-M	*IntelliNet* 2.0 Fire Subscriber, 4x4 Zone (4 Reversing Polarity, 4 Supervised) with Multiple Communication Technologies (MCT), Red Enclosure
7707P-44-ULP-M	*IntelliNet* 2.0 Fire Subscriber, 4x4 Zone (4 Reversing Polarity, 4 Supervised) with 7794A AES-*IntelliPro*, and integrated onboard Local Annunciator plus MCT, Red Enclosure
2.0 ACCESSORIES	
7794A	Standalone AES-*IntelliPro* Fire full data module add-on accessory board with firmware for new *IntelliNet* 2.0 units only, cannot be used in legacy units
77-WiFi	AES certified WiFi adapter
77-FACPA	FACP Power Supply Adapter for internal mount
77-FACPA-KIT	External installation hardware for 2-way Junction Box
***Legacy* Fire Subscribers**	
7706-ULF	Integrated Fire Monitoring System, Red Enclosure
7788F-ULP-P	Legacy Fire Subscriber, 8 Zone with 7795 AES-*IntelliPro* (7794 full data module, 7762 hardware supervisory module, and 7740 Local Annunciator), Red Enclosure
7788F-ULP	Legacy Fire Subscriber, 8 Zone, 8 Supervised Zones with 7794 AES-*IntelliPro*, Red Enclosure
7788F	Legacy Fire Subscriber, 8 Zone, 8 Supervised Zones, Red Enclosure
7744F-ULP-P	Legacy Fire Subscriber, 4 Zone with 7795 AES-*IntelliPro* (7794 full data module, 7762 hardware supervisory module, and 7740 Local Annunciator), Red Enclosure
7744F-ULP	Legacy Fire Subscriber, 4x4 Zone, 4 Supervised Zones with 7794 AES-*IntelliPro*, Red Enclosure
7744F	Legacy Fire Subscriber, 4x4 Zone, 4 Reversing Polarity, 4 Supervised Zones, Red Enclosure
LEGACY ACCESSORIES	
7794	Standalone AES-*IntelliPro* Fire full data module add-on accessory board for legacy units only, please see 7794A above for *IntelliNet* 2.0 version

Technical Specifications

7707 Fire

DIMENSIONS
13"H x 8.5"W x 4.5"D
(33cmH x 21.5cmW x 11.4cmD)

WEIGHT
5.8 lbs (2.6 kilograms) excluding battery
13 lbs (5.9 kilograms) with 10 Ah battery

RADIO FREQUENCY
Standard Frequency Range: 450-470 MHz
Contact AES for other UHF and VHF frequencies

ANTENNA
2.5 dB tamper resistant antenna included, mounts on enclosure
Optional remote mounting antenna available

POWER INPUT
AC SOURCES
Transformer: Class 2
16.5V AC nominal output
1.9 A max current (40 VA MIN)
ELK ELK-TRG1640,
MG ELECTRONIC SALES MGT1640,
or AES 1640 (not included)
DC SOURCES (includes FACP)
24V DC Regulated Power Supply with Subscriber
Rechargeable Battery
1.9 A max current

BACKUP BATTERY
10-12 Ah, UL recognized lead acid gel cell, size based on subscriber configuration

ALARM SIGNAL INPUTS/ZONES
- 8 individually programmable E.O.L. type zone inputs
- 4+4: 4 reverse polarity input and 4 individually programmable E.O.L. type zone inputs
- Optional 7794A AES-*IntelliPro* for full data via Contact ID, Pulse, Modem IIe and Modem IIIa2

UL LISTINGS
UL 864 10th Edition
Standard for Control Units and Accessories for Fire Alarm Systems
ULC S559-04 1st Edition
Equipment for Fire Signal Receiving Centres and Systems

TROUBLE OUTPUT—ACK DELAY/ANTENNA CUT
Form C relay, fail secure, rated 24V DC 1A resistive, unsupervised

RESET BUTTON
Located on main circuit board

OPERATING TEMPERATURE
32 to 120°F (0 to 49°C)

STORAGE TEMPERATURE
14 to 140°F (-10 to 60°C)

RELATIVE HUMIDITY
0 to 93%, non-condensing

RECHARGE CAPABILITY
Will charge 12V battery size from 10-12 Ah

PORTS
Ethernet for configuration and message communication
USB access for software upgrade

REMOTE ANNUNCIATOR
AES Model 7740
Remote Annunciator, supervised

COMPATIBLE RECEIVERS
7705i AES-MultiNet Receiver

CONFIGURATION INTERFACE
Web browser capable device accessible via smartphone, tablet, laptop, or PC

CURRENT CONSUMPTION
Standby w/ charged backup battery:
200 mA (1.2 A Transmitting)
Standby + charging backup battery:
900 mA (1.9 A Transmitting - MAX)

POWER OUTPUT
2 or 5 Watts
Factory set

ENCLOSURE MATERIAL
Steel with paint finish

FINISH COLOR
Red

VISUAL INDICATORS
Front panel LCD
(2 x 20 alphanumeric character backlit display)
Power and Trouble LEDs
(ALM, Trouble, Tx, Rx, WA)

Contact Us

For pricing and availability or to learn more about *IntelliNet* 2.0, please call your local AES Sales Representative at **(800) 237-6387** or email **sales@aes-corp.com**.

www.aes-corp.com

AES Corporation | 285 Newbury Street | Peabody, MA 01960 United States

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ORDER PROCESSING
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Peabody, MA 01960 USA

(800) 237-6387 *toll free*
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Accessories Guide 2020

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Fire 2.0 Add-Ons

75-7177-1

Replacement Antenna Supervision Module (ASM) for the 7177 Hybrid 2.0 Fire Subscriber only (not intended for use on 7707 2.0 Fire or 7788/7744 Legacy models)

$75.00

7794A

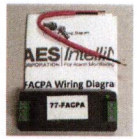
Standalone AES-*IntelliPro* Fire full data module add-on accessory board with firmware for new *IntelliNet* 2.0 units only, cannot be used in legacy units

$75.00

77-WiFi

AES certified WiFi adapter

$15.00

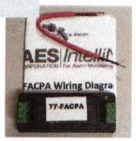


77-FACPA

AES Certified FACP Adapter, includes 1 cable and 2 screws for internal mount

$30.00

Kit



77-FACPA-KIT

Installation hardware for 2-way Junction box, includes mounting plate and 4 screws for external mount in gang box (external mounting kit ONLY)

$5.00

Please contact your local AES Sales Representative for availability.

Legacy Fire Add-Ons

7740

Standalone Local Annunciator for fire radios, UL Listed

$72.00

7770

FireTap Full Data Module with serial connection to specific FACPs

$150.00

7794

AES-*IntelliPro* Fire Full Data Module with built-in phone line simulator, UL listed for Fire radios

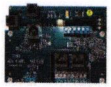
$75.00

10-Pack

7794-10 Pack

Pack of 10 AES-*IntelliPros* Fire

$710.00

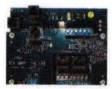


7795

AES-*IntelliPro* Fire Full Data Module (7794) with 7762 Hardware Supervisory Module and 7740 AES Local Annunciator. UL listed for primary standalone communication with fire radios

$197.00

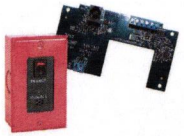
10-Pack



7795-10 Pack

Pack of 10 — 7795 (see description to the left)

$1,870.00



7742

Bundles 7740 Annunciator with 7762 add-on module

$12.00

Kit

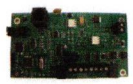
09-2015-4M (Kit)

AES-*IntelliPro* Stand-off Kit (Set of 4), works with 7794A & 7094A

$6.00

Burglary Add-Ons

Burglary 2.0 Add-Ons



7094A

Standalone AES-*IntelliPro* Fire full data module add-on accessory board with firmware for new *IntelliNet* 2.0 units only, cannot be used in Legacy units

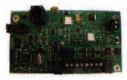
$59.00

77-WiFi*

AES certified WiFi adapter
**Refer to same Model Number for Burglary as for Fire*

$15.00

Legacy Burglary Add-Ons

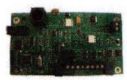


7094

AES-*IntelliPro* Full Data Module with built-in phone line simulator, remote Account administration for specific burglary panels

$59.00

10-Pack



7094-10 Pack

Pack of 10 AES-*IntelliPros*

$550.00

7041E

Legacy Handheld Programmer, cannot be used with *IntelliNet* 2.0 units

$309.00

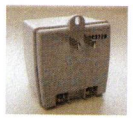
Kit

09-2015-4M (Kit)

AES-*IntelliPro* Stand-off Kit (Set of 4), works with 7794A & 7094A

$6.00

Transformers & Batteries

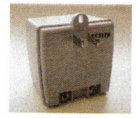


1640

16.5 Volt AC 40 VA Class 2 Transformer

$8.95

10-Pack



1640-10 Pack

16.5 Volt AC 40 VA Class 2 Transformer (10 Pack)

$81.50

1640-ENCL

Enclosure for Class 2 Transformer

$28.00

8124

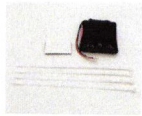
12 Volt 4 Amp Hour Gel Cell Battery

$19.20

8127

12 Volt 7.5 Amp Hour Gel Cell Battery

$33.00



NCT BATT KIT

Battery replacement for the 7245 Network Connectivity Tool

Kit includes battery, tie wraps (4), Velcro, and an instruction sheet

$48.99

Please contact your local AES Sales Representative for availability.

Online: www.aes-corp.com · **Email:** order@aes-corp.com · **Fax:** (978) 535-7313

Standard Antennas & Mounts

7214

2.5dB Tamper Resistant Rubber Duck Antenna Kit (including cable)

$13.00

Kit

7214-EMK

External Antenna Mounting Kit (1 Antenna Mounting Bracket, 1 TNC male inline, 1 TNC female bulkhead, 6' RG58 coax cable)

$25.00

7210-3-UM

3dB Omni Directional UHF Antenna (includes 52-0057 Mounting Kit)

$28.00

7210-5-UM

5dB Omni Directional UHF Antenna (includes 52-0057 Mounting Kit)

$27.00

7210-6-UC

6dB Omni Directional UHF Antenna

$69.00

7210-7-US

7dB Omni Directional UHF Antenna *(for 460-470MHz range only)*

$95.00

7210-9-UC

9dB Omni Directional UHF Antenna

$95.00

7211

Stealth Antenna *(for 450-470MHz range only)*

$26.50

7260-EMM

Eave Mount Mast

$50.00

For VHF frequencies, appropriate model with closest match to customer frequency will be supplied. For frequencies outside the 450-470MHz range, please call Order Processing for availability.

7261-OB

Offset Bracket

$25.00

7262-TM

Tripod Mount 3'

$60.00

7263-UAM

Universal Antenna Mount

$60.00

Kit

7264-PA-KIT

Phantom Antenna including 52-0057 Mounting Kit

$67.00

52-0057

Mounting Kit for 3dB, 5dB, and Phantom Antenna

$12.00

7264-PA-SUB

Phantom Antenna, Adapter, and NMO Mount

$104.00

Kit

7264-SUB-KIT

TNC to N-Type Adapter and NMO Mount for Retrofit

$37.00

12-0181

TNC(F) to N-Type(M) Adapter Only

$12.75

52-7264

NMO Antenna Mount Only

$24.25

13-0345-3

Cable Assembly
(3 Ft, RG-8, N male ↔ N male)

$32.36

13-0345-6

Cable Assembly
(6 Ft, RG-8, N male ↔ N male)

$33.95

13-0345-10

Cable Assembly
(10 Ft, RG-8, N male ↔ N male)

$45.38

13-0345-25

Cable Assembly
(25 Ft, RG-8, N male ↔ N male)
**Custom, requires extended lead time*

$86.35

13-0345-50

Cable Assembly
(50 Ft, RG-8, N male ↔ N male)
**Custom, requires extended lead time*

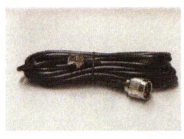
$140.97

13-0345-100

Cable Assembly
(100 Ft, RG-8, W/1 N male ↔ X) on spool
**Custom, requires extended lead time*

$189.00

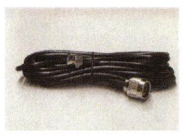
Note: 13-0345-100 only available in 100' length. Shorter lengths can be User cut from the 100' spool. At least 1 separately ordered loose connector required to complete assembly (see below). 7244 crimp tool required for 12-0101.



7220-10-N

Cable Assembly
(10 Ft, RG-58, BNC male ↔ N male)

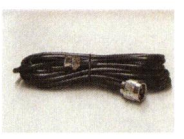
$29.00



7220-15-N

Cable Assembly
(15 Ft, RG-58, BNC male ↔ N male)

$30.00



7220-20-N

Cable Assembly
(20 Ft, RG-58, BNC male ↔ N male)

$31.00

7220-25-N

Cable Assembly
(25 Ft, RG-58, BNC male ↔ N male)

$32.00

13-0346

Cable Assembly
(18 In, RG-58, N female bulkhead ↔ BNC male)
**Used to connect RG-8 with N male to enclosure body*

$18.92

Please contact your local AES Sales Representative for availability.

Loose Coaxial Connectors & Adapters

7244

Crimp Tool for RG-8 Coaxial Connectors

$74.00

7240

7058E J4 Output Connector and Cable (10 Pack)

$16.00

12-0101

N-Type Plug (Male), Crimp Style for RG-8 Coax (9913)

$8.32

12-0102

BNC Plug (Male), Crimp Style for RG-58 Coax

$5.14

12-1026

TNC Crimp Connector (Male), for RG-58 Coax

$5.25

12-1027

TNC Crimp Connector (Male), for RG-8 Coax

$9.75

Please contact your local AES Sales Representative for availability.

Spare/Replacement Radio Transceiver

7085N

2 Watt Radio Transceiver

$150.00

Replacement radios will be tuned to authorized AES Dealer's frequency only.

Surge Protectors & Band Pass Filters

52-0479

UHF Band Pass Filter

(please contact your local AES Sales Rep for availability)

$695.00

7230

Standard Coaxial Surge Protector, N female ↔ N female

$65.00

Programmers, Cords, & PC or Laptop Programming Cables

7041E

Handheld Programmer with RJ-11 Cable allows for programming Fire Subscribers, Burglary Subscribers (without 7094 AES-*IntelliPro* module)

$309.00

7043

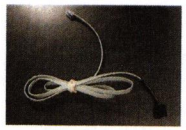
Programming Cable for PC or Laptop to 7094 AES-*IntelliPro* with 5x2 Plug

$27.50

7043E

Programming Cable for PC or Laptop allows for programming Fire Subscribers, Burglary Subscribers (without 7094 AES-*IntelliPro* module), with RJ-11 Jack

$27.50



13-7094

Handheld Programmer Programming Cable for 7094 AES-*IntelliPro*

$16.00

7241

Replacement Handheld Programmer Cord, with 5x2 Plug, to program 7094 AES-*IntelliPro*

$16.00

7241E

Replacement Handheld Programmer Cord, allows for programming Fire Subscribers, Burglary Subscribers (without 7094 AES-*IntelliPro* module), with RJ-11 Plug

$16.00

8600-BWM

Bird Wattmeter 43 includes 8600-E400 Element

$680.00

8600-E400

400-1000 MHz Plug-In Elements (E Series)

$120.00

Please contact your local AES Sales Representative for availability.

Accessories Order Form

AES CORPORATION 40 Years of SECURITY INNOVATION

AES SALES REPRESENTATIVE	**DATE**
COMPANY NAME	**DLR #**
PURCHASER NAME	**PO #**
SEND TO ATTENTION OF	**ORDER TYPE** Standard ☐ Blanket ☐ Change ☐
SHIP TO ADDRESS *(Street, not PO Box)*	**BILL TO ADDRESS** *(only if different than Ship To)*
CITY, STATE, ZIP	**CITY, STATE, ZIP**
COUNTRY	**COUNTRY**
PHONE	**FAX**
EMAIL	

QUANTITY	MODEL NUMBER	DESCRIPTION	SPECIAL REQUIREMENTS

CUSTOMER RADIO FREQUENCY *(Required)*	**REQUESTED DELIVERY DATE** Overnight ☐ 2-Day ☐ 3-Day ☐ Ground ☐
SPECIAL INSTRUCTIONS	

ANTENNA & ACCESSORY GUIDE

Select antennas available in lower frequencies. Please call for detailed information.

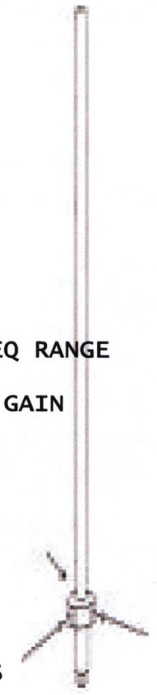
				
PART NUMBER	7214	7210-3-FREQ RANGE	7211-FREQ RANGE	7210-5-FREQ RANGE
DESCRIPTION	RUBBER DUCK	STANDARD 3 dB	STEALTH	HI GAIN
FREQUENCY RANGES	400-500	450-470	450-470	450-470
GAIN	2.5 dB	2.5 dB	3 dB	5 dB
POWER CAPABILITY	5 Watt	50 Watt	50 Watt	50 Watt
MAST/WHIP LENGTH	11.5"	14"	24"	28.5"
MAST/WHIP MATERIAL	BLACK VINYL CLAD	STAINLESS STEEL	VINYL CLAD	STAINLESS STEEL
MOUNT STYLE	MOUNTS ON CASE	UNIVERSAL MOUNT	EASY HANG MOUNT	UNIVERSAL MOUNT
GROUND RADIALS INCLUDED	NO, CASE IS GROUND PLANE	YES	YES	YES
CONNECTOR TYPE	TNC	N	TNC	N
RECOMMENDED CABLE	CABLE INCLUDED	10 OR 25'	10' CABLE INCL	10 OR 25'
APPLICATION	INDOOR	INDOOR/OUTDOOR	INDOOR	INDOOR/OUTDOOR
BANDWIDTH	+/- 5MHz	+/- 5MHz	+/- 5MHz	+/- 5MHz
VERTICAL BEAM WIDTH	38 DEGREE	35 DEGREE	35 DEGREE	18 DEGREE
HORIZONTAL BEAM WDTH	OMNIDIRECTIONAL	OMNIDIRECTIONAL	OMNIDIRECTIONAL	OMNIDIRECTIONAL

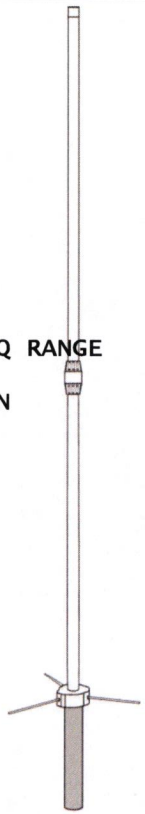
AES Corporation | 285 Newbury Street, Peabody, MA 01960 USA | **(800) 237-6387** or (978) 535-7310 | (978) 535-7313 fax | www.aes-corp.com

ANTENNA & ACCESSORY GUIDE

Select antennas available in lower frequencies. Please call for detailed information.

	7210-6-FREQ RANGE	7210-7-FREQ RANGE	7210-9-FREQ RANGE
PART NUMBER			
DESCRIPTION	RUGGED HI GAIN	HIGHER GAIN	CENTRAL STATION
FREQUENCY RANGES	450-470	460-470	450-470
GAIN	6 dB	7+ dB	9 dB
POWER CAPABILITY	150 Watt	200 Watt	200 Watt
MAST/WHIP LENGTH	45.5"	60"	115"
MAST/WHIP MATERIAL	FIBERGLASS	FIBERGLASS	FIBERGLASS
MOUNT STYLE	MAST MOUNT	MAST MOUNT	MAST MOUNT
GROUND RADIALS INCLUDED	YES	YES	YES
CONNECTOR TYPE	N	N	N
RECOMMENDED CABLE	10 OR 25'	10 OR 25'	10 OR 25'
APPLICATION	INDOOR/OUTDOOR	INDOOR/OUTDOOR	INDOOR/OUTDOOR
BANDWIDTH	+/- 5MHz	+/- 5MHz	+/- 5MHz
VERTICAL BEAM WIDTH	14 DEGREE	12 DEGREE	7 DEGREE
HORIZONTAL BEAM WDTH	OMNIDIRECTIONAL	OMNIDIRECTIONAL	OMNIDIRECTIONAL





10' Cable

RG58 Low Loss
BNC male to N male
PN 7220-10-N

25' Cable

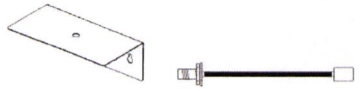
RG58 Low Loss
BNC male to N male
PN 7220-25-N

Lightning Protector

N female to N female
Coax Inline
A MUST for systems with outdoor antennas
PN 7230

External Antenna Mounting Kit

1 Antenna Mounting Bracket
1 TNC male inline
1 TNC female bulkhead
6' RG58 coax cable
PN 7214-EMK



AES Corporation | 285 Newbury Street, Peabody, MA 01960 USA | **(800) 237-6387** or (978) 535-7310 | (978) 535-7313 fax | www.aes-corp.com

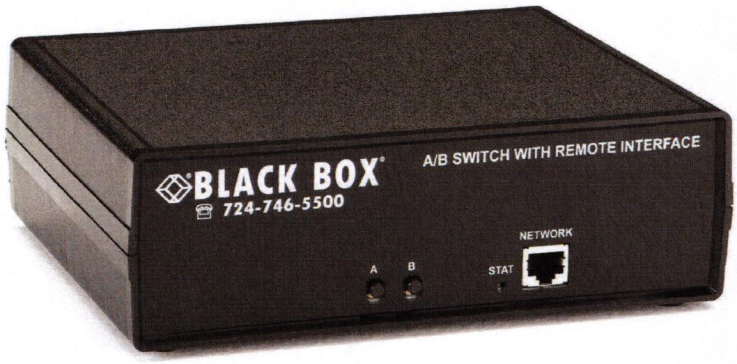
BLACK BOX®

SW1040A
SW1041A

CAT6 Remotely Controlled Layer 1 A/B Switch, Latching

Switch between two networks with this Layer 1 switch.

SW1040A is a basic latching A/B switch and
SW1041A is a basic latching A/B switch with RS-232 Ethernet.



Customer Support Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)
FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746
Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: www.blackbox.com • E-mail: info@blackbox.com

Trademarks Used in this Manual

Federal Communications Commission and Industry Canada Radio Frequency Interference Statements

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

Instrucciones de Seguridad
(Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
    - A: El cable de poder o el contacto ha sido dañado; u
    - B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    - C: El aparato ha sido expuesto a la lluvia; o
    - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    - E: El aparato ha sido tirado o su cubierta ha sido dañada.

Table of Contents

1. Specifications

Data Rates	10/100/1000 and 10G Ethernet *NOTE: Switch ports are transparent to data rates, formats, and protocols.*
Output Status Relay Contact Rating	30 VDC, 1 A maximum (resistive)
Remote Contol Inputs	External dry contact not to exceed 100 ohms resistance, including cable
Switching Durablility	1,000,000 operations
Switching Load	Additional 65 mA DC, Additional 20 mA (AC RMS) *NOTE: The switching load is applied for approximately 0.15 seconds during switching.*
Connectors	SW1040A: A/B Switch Ports: (3) RJ-45 CAT6, Remote Control Status Port: (1) 6-position pluggable Phoenix terminal block, Power: (1) 3.5-mm power input; SW1041A: A/B Switch Ports: (3) RJ-45 CAT6, Ethernet Control Port: (1) RJ-45, Serial Control Port: (1) DB9 F, Remote Control Status Port: (1) 6-position pluggable Phoenix terminal block, Power: (1) 3.5-mm power input
Indicators	(2) Switch Position LEDs (A and B), (1) Command Status LED
Power	100–240 VAC, 50/60-Hz wallmount power supply, 12-VDC output
Environmental	Temperature Tolerance: Operating: 32 to 104° F (0 to 40° C), Storage: -4 to 158° F (-20 to 70° C) Humidity Tolerance: Up to 95%, noncondensing Altitude: Up to 10,000 ft. (3048 m)
Dimensions	2.5"H x 6.25"W x 8.1"D (6.4 x 15.9 x 20.6 cm)
Weight	4 lb. (1.8 kg), including power supply

2. Introduction

The CAT6 Remotely Controlled Layer 1 A/B Switch, Latching (SW1040A) or CAT6 Remotely Controlled Layer 1 A/B Switch, Latching, Ethernet, RS-232 (SW1041A) connects port A or port B to the C (Common) port, through latching relay switch mechanisms. The connection state will be maintained if power fails or is removed.

Manual control of the switch port connection state is supported through pushbutton switches on the front of the unit. A 6-position pluggable terminal block connector on the rear of the unit provides remote control capability and accepts external dry contact closures as inputs. See Section 5.1 and Section 5.2 for additional details.

Models with Serial control capability (SW1041A) include an RS-232 console port that can be used to control the switch port connection state, as well as monitor switch status using a serial RS-232 terminal type device. See Section 5.3 and Section 7 for additional details.

Models with Ethernet control (SW1041A) include an Ethernet network interface that can be used to control the switch port connection state, as well as monitor switch status via a web browser, telnet, or using SNMP. These models also have intelligent automatic switching capabilities, and they support sending SNMP traps or syslog messages (user configurable) for various events and errors. See sections 5.4, 5.5, 7, 10, and 11 for additional details.

3. Configuration

There are no DIP switch or jumper settings that need to be modified in order to operate the basic functrions of the A/B Switch. There are, however, several parameters related to Ethernet remote access/control and the automatic switching features that are configurable. These settings are described later in this manual.

NOTE: The internal jumpers and DIP switches inside the A/B Switch have been pre-configured at the factory and should not be changed from their default settings. They are shown here for reference only.

Table 3-1. Jumper settings.

Jumper	Position	Function
W1	1–2 position	no Ethernet control module (SW1040A)
	2–3 position	Ethernet control module (SW1041A)
W2	1–2 position	no Ethernet control module (SW1040A)
	2–3 position	Ethernet contol module (SW1041A)

NOTE: DIP switch SW1 (resistors may be installed for "closed" positions).

Table 3-2. DIP Switch SW1 settings.

SW1 Position	Function
1 Open	Latching relays (SW1040A, SW1041A)
1 Closed	Not used
2 Open	No Ethernet control module (SW1040A)
2 Closed	Ethernet control module (SW1041A)
3–8 Open	Reserved for future use

4. Installation

- Find a location suitable for installing the A/B Switch, with access to AC power and the connections you intend to switch through the unit.
- If you intend to use serial control (SW1041A), connect a serial cable to the DB9 RS232 console port. The baud rate is fixed at 9600 baud, no parity, 8 data bits, and 1 stop. See table 6.1 for the console port connector pin assignments.
- If you intend to use external dry contact closures to control the A/B Switch, connect the external contacts to the 6-position terminal block as described in Section 5.2.
- Connect the provided 12-VDC power supply to an AC source and to the 3.5 mm power supply connector on the A/B Switch. When power is first applied, it is recommended that the user change connection states on the A/B Switch from A to B and back again to be sure that all the relays are in a known state, prior to connecting any external devices. Press and hold (for approximately 1 second) the appropriate front panel pushbutton switch until the A/B Switch changes connection state. One of the LEDs, A or B, on the front of the unit will indicate the selected connection state and also serves to show that the switch has power.
- Connect RJ-45 cables (SW1040A, SW1041A) between the A, B and C ports on the switch and your devices. The A/B Switch connects the C (Common) port to either the A or B port.

NOTE: The A/B Switch ports provide straight-through connections and are bidirectional, i.e. they have no preference to signal direction. If your application requires a crossover cable, use only 1 cross-over cable in that path. Use a straight through cable on the other side of the switch.

- If you are connecting the Ethernet control interface on the A/B Switch (SW1041A) to your network, you must first set the IP address, subnet mask and gateway address parameters of the A/B Switch using the serial port. You should set these parameters before attaching a cable to the NETWORK port, as the default parameters may not work or could interfere with the operation of your Ethernet network. See Section 6 for more information regarding IP setup.

5. Operation

When power is applied to the A/B Switch, one of the LED switch position indicators (A or B) on the front of the unit will illuminate to show the connection state of the switch. Indicator A lights when the switch is in position A, and Indicator B lights when the switch is in position B. If neither or both LEDs are lit, then a fault has occurred, or power has been removed.

5.1 Manual Switching

You can manually switch the A/B Switches using the push button switches located on the front of the unit. To select the connection state, you must hold the appropriate push button switch for one second before the unit will switch. This is to minimize the risk of inadvertently switching the A/B Switch.

5.2 Dry Contact Closure Switching

You can also switch connection states and monitor the status of the A/B Switch using the remote control connections on the 6-position terminal block, located on the rear of the unit. Connecting (shorting) input A (pin 1) to Ground (pin 2) for a minimum of approximately 100 msec will cause the unit to switch to the A position, and connecting (shorting) input B (pin 3) to Ground (pin 2) for a minimum of approximately 100 msec will cause the unit to switch to the B position. If desired, the A or B control input can remain connected to the Ground input, which will disable all other control interfaces including the front panel pushbutton switches from being able to switch connection states of the A/B Switch.

NOTE: To ensure reliable operation, the external dry contacts and any associated cable connected to the 6-position terminal block should not exceed 100 ohms resistance. Once the A/B Switch has switched connection states, the status relay contact pin 5 will be internally connected (shorted) to either pin 4 (switch in position A) or pin 6 (switch in position B). See Table 5-1 for the pin assignments on the 6-position terminal block.

Table 5-1. 6-position terminal block pin assignments.

Pin Number	Description
1	A control input
2	Ground
3	B control input
4	Status Relay A contact
5	Status Relay COMMON
6	Status Relay B contact

5.3 Serial RS-232 Switching (SW1041A)

A/B Switch model SW1041A supports serial remote control and can be switched using commands over a serial RS-232 communications line. The parameters of the A/B Switch console port are fixed at 9600 baud, no parity, 8 data bits, and 1 stop bit (commonly abbreviated as 9600, 8, N, 1). To communicate with the A/B Switch, you will need a serial terminal or similar device configured to these settings. Use a straight-through M/F cable to connect the A/B Switch console connector to this terminal or other device that follows the standard IBM PC DB9 serial port pinout. See Table 6-1 for the A/B Switch console port connector pin assignments.

When the A/B Switch powers up, it will send a sign-on message followed by a prompt character ">" to your serial terminal device. After each command and the associated response, the A/B Switch will again issue a prompt character. For systems where the console port is being commanded by software, the software should wait for this prompt character before sending each and every command to the A/B Switch. All commands are case insensitive and can be entered in upper or lower case. Note however, that password parameters are case sensitive. All commands must be terminated with a carriage return (ASCII 13 or hex 0x0D) before they will be accepted by the A/B Switch. Several commands can be abbreviated by using just the first character of each command word, for example the set/get system commands can be abbreviated using "g s" for "get system" or "s s a" for "set system a".

5.4 Ethernet Switching (SW1041A)

A/B Switch model SW1041A supports Ethernet remote control and can be switched using commands sent over an Ethernet network. In order to use the Ethernet Network port on the A/B Switch you must set the IPADDRESS, SUBNETMASK, and GATEWAY address parameters before connecting to your network. See Section 6 for more details on how to do this. After setting up the system and powering up for the first time, you may also need to change other parameters for your application. All configuration parameters are stored in non-volatile memory. They are immediately active when a change is made, but they will not become permanent until the SAVE command, followed by the RESET command has been executed.

Once the Ethernet remote control port has been configured, the A/B Switch can be switched using SNMP commands—see the MIB path summary in the appendix for a list of SNMP variables and their functions.

The A/B Switch also supports remote telnet access, and can be controlled via a telnet session using the same commands as supported by the RS-232 serial interface. Refer to Section 7 for the complete list of console commands.

As an additional option, A/B Switch models that support Ethernet remote control also include a built-in http server application that allows all of the console commands listed in section 7 to be accessed via a web browser interface. See Section 8 for more details about the web browser interface feature.

NOTE: The NETWORK port on the A/B Switch is 10BASE-T only. The STATUS LED will blink whenever the A/B Switch receives a command from the Ethernet network interface or from the serial RS232 interface. In addition the STATUS LED will blink when a switching command is issued via the remote control contacts or front panel push button switches.

The A/B Switch also has the ability to issue either SNMP traps, or UDP syslog messages. These messages can be sent to one or more network administrator systems to provide notification when the A/B Switch changes connection states either automatically (auto bypass switching or auto recovery switching) or via manual control (front panel toggle switch or commands received on the RS232 or Ethernet interfaces), and when certain other events occur. See Section 10 and Section 11 for additional details.

To restrict access to the A/B Switch, each of the Ethernet interface options (SNMP, telnet, and web browser) can be independently enabled/disabled, and if enabled, can be configured to require a login password. Additionally, user access can be restricted by IP address so only commands received from pre-defined "administrator" IP addresses will be acknowledged and acted upon. See section 7 for additional information regarding these commands.

5.5 Automatic Switching

The A/B Switch models that support Ethernet remote control can also be configured to automatically switch between a "normal" connection state (port C connected to port B) and a "bypass" or "failover" connection state (port C connected to port A). User configurable failover and recovery parameters control the auto-switching functions to allow the switch to be used in a variety of applications. In order to be able to perform the auto bypass and auto recovery switching functions, the A/B Switch issues ICMP echo request (PING) packets from its Ethernet network interface to a user configurable IP address on the network. If the "normal" network path connections between the A/B Switch and the device being monitored go down for any reason, the A/B Switch will no longer be able to PING the specified IP address, and will then automatically switch from the "normal" connection state (port C connected to port B) to the "bypass" or "failover" connection state (port C connected to port A). Once the problems on the primary path have been identified and corrected, the user can issue a command to cause the A/B Switch to switch from the failover connection state back to the normal connection state. If auto recovery is enabled, the A/B Switch will automatically re-connect the normal path connections when it is again able to PING the user specified IP address. When using the auto recovery feature, make sure that the Ethernet network port on the A/B Switch is connected to the user's network so that the normal path is continuously being monitored even when the backup path has been selected; otherwise, the A/B Switch could repeatedly switch (flap) back and forth between the failed primary path and the functioning backup path. See Figures 5-1 and 5-2 for examples of auto switching configurations.

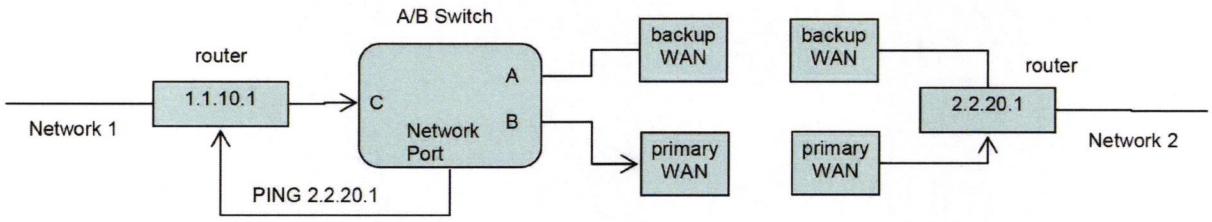


Figure 5-1. Auto Failover and Manual Recovery.

NOTE: The A/B Switch monitors the WAN connections by PINGing the far side router through the primary WAN link. If the primary WAN link fails, the A/B Switch auto switches to the backup WAN link. Auto recovery is disabled in this configuration to prevent flapping.

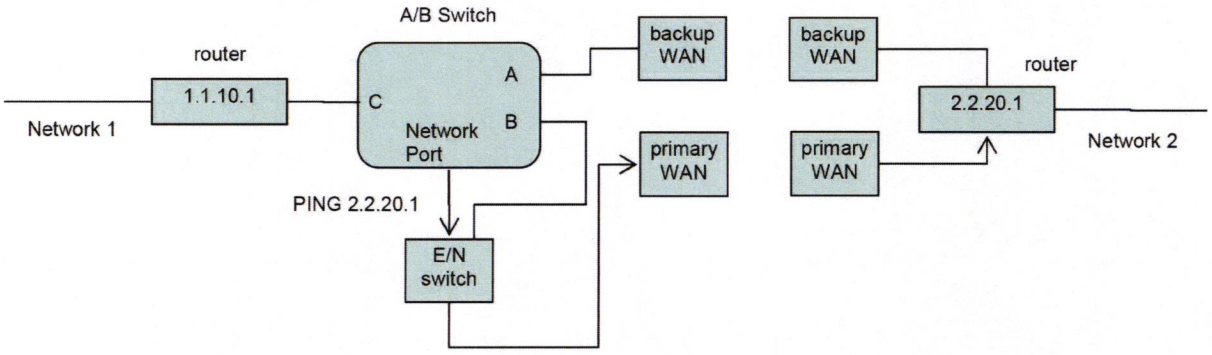


Figure 5-2. Auto Failover and Auto Recovery.

NOTE: The A/B Switch monitors the WAN connections by PINGing the far side router through the primary WAN link. If the primary WAN link fails, the A/B Switch auto switches to the backup WAN link. When the primary WAN link is available again, the A/B Switch auto switches back to the primary.

The monitorip address and monitormac address parameters can be configured to allow the A/B Switch to monitor connectivity to any device within, or outside of the A/B Switch's subnet. If monitoring connectivity to a device on the same subnet as the A/B Switch's internal Ethernet node, set the A/B Switch's monitorip address and monitormac address parameters to the IP address and MAC address of the device being monitored. If monitoring connectivity to a device on a different subnet/network than the A/B Switch's internal Ethernet node, set the A/B Switch's monitormac address parameter to the MAC address of the gateway router on the A/B Switch's subnet, and set the monitorip address parameter to the IP address of the device being monitored. This allows the PING packet issued by the A/B Switch to be routed through the gateway router to the target device on a different subnet/network. If you don't know the MAC address of the target device or the gateway router on the A/B Switch's subnet, one method is to open a command prompt window on a P.C. attached to that same subnet and use the "arp -a" command to retrieve this information from the P.C.'s arp cache (you may need to PING the IP address first before the entry will appear in the arp cache).

In most network environments, rather than manually configuring the monitormac address, you can configure the A/B Switch to automatically determine the proper MAC address required for the PING packet. Enter the monitorip address information as noted above, and then set the monitormac address parameter to 00 00 00 00 00 00. This causes the A/B Switch to issuing an ARP request to the gateway router which will respond with the appropriate MAC address information needed.

NOTE: When the Auto Switch feature is enabled, manual switching can be performed, but will be overridden by any auto switching commands that are subsequently issued by the A/B Switch.

6. Ethernet Network Interface Setup (SW1041A Only)

To perform initial setup of the network management interface on the SW1041A A/B Switch, you will need a serial terminal capable of 9600 baud, no parity, 8 data bits, and 1 stop bit. Connect this terminal to the DB9 console connector on the A/B Switch. A straight thru M/F cable is required to connect to an IBM PC standard DB9 serial port. For connection to other device types a custom cable pinout may be required—see Table 6-1 below for the DB9 pin assignment on the A/B Switch.

Table 6-1. DB9 Pin Assignment.

DB9	Signal	Direction
2	Received Data	To Terminal
3	Transmitted Data	From Terminal
5	Ground	—

Apply power to the system.

After initialization is complete you will see a sign-on message displayed on the serial console, e.g.

```
D1000 Network Agent Version 2.9h MAY 2008
Copyright 2008 (c)
All rights reserved
System starting ...
Rack position A
Console ready
>
```

At this point, the A/B Switch is ready to accept the configuration commands that are necessary before you will be able to communicate with the unit over an Ethernet network. You will need to enter an IP address, subnet mask, and gateway address information for basic access. You will also need to set the read and write SNMP community names if using SNMP, or a web password to allow web browser access, or a telnet password if you plan to control the A/B Switch via telnet. After entering these parameters you will need to save them into non-volatile memory on the A/B Switch. Any time one or more of these parameters is changed; they must be saved followed by a system RESET in order for the changes to become permanent. The following shows a typical setup session. Change the entered parameters to suit your application requirements. All of the console level commands are described in detail in Section 7.

```
>set ipaddress 192.168.1.200
OK
>set subnetmask 255.255.255.0
OK
>set gateway 192.168.1.1
OK
>set readcommunityname public
OK
>set writecommunityname private
OK
>save
OK
>reset
resetting, please wait . . .
```

After the system reinitializes, you will again be greeted by the sign-on message as before. At this time you can connect an Ethernet cable to the 10Base-T network port on the A/B Switch and to an available port on your Ethernet switch or router. The A/B Switch will respond to SNMP, telnet and HTTP messages at the assigned IP address.

7. Console Commands (SW1041A Only)

The following commands are available from the RS-232 console port or from the Ethernet network port on the SW1041A A/B Switch, since it supports these remote control interfaces. All commands are case-insensitive, although several parameters are case-sensitive (read/write community names and web and telnet passwords). GET, SET, and SYSTEM can all be abbreviated by the first letter of the command. This allows shorthand entry of switching commands. Each available command is shown along with an example of a typical response.

GET ALL

Displays all parameters and settings. An example output is shown here.

System Status: B
IP Address: 192.168.1.39
MAC Address: 00 06 57 00 01 02
Subnet Mask: 255.255.255.0
Gateway IP Address: 192.168.1.1
PING Reply: Enabled
SNMP Enable: Enabled
Read Community Name: public
Write Community Name: private
Web Enable: Enabled
Web Password: mctech
Web Timeout: 300
Web Port: 80
Telnet Enable: Enabled
Telnet Password: dataman
Telnet Timeout: 80
Telnet Port: 23
Monitor IP Address: 192.168.1.113
Monitor MAC Address: 00 00 00 00 00 00
Monitor Interval: 10
Monitor Fail Count: 5
Monitor Ok Count: 5
Authentication Trap: Disabled
Alert Type: TRAP
D1000: 2.9N JUL 2010, d1000 Rev B
ADMIN IP Addresses:
SNMP Managers:
1: 192.168.1.113
2: 192.168.1.115
3: 192.168.1.149

GET VERSION

Displays the software revision of the system.

D1000: 2.9h MAY 2008, d1000 Rev B

GET SYSTEM

Displays the system status. This is the same as the status returned by the SNMP variable d1000SwitchControl. It will report "A" if the switch is in position A, and "B" if the switch is in position B.

System Status: A

SET SYSTEM A[B]

Sets the system to position A or B.

SET IPADDRESS X.X.X.X
GET IPADDRESS

Set or display the current IP address of the network module. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET SUBNETMASK X.X.X.X
GET SUBNETMASK

Set or display the current subnet mask of the network module. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET GATEWAY X.X.X.X
GET GATEWAY

Set or display the current gateway IP address of the network module Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET PINGREPLY ON[OFF]
GET PINGREPLY

Set or display whether or not the A/B Switch will respond to incoming PINGs (ICMP echo requests). Any change will not become permanent until a SAVE operation is performed.

SET SNMPENABLE ON[OFF]
GET SNMPENABLE

Set or display whether or not the SNMP interface on the A/B Switch is enabled. Any change will not become permanent until a SAVE operation is performed.

SET READCOMMUNITYNAME string
GET READCOMMUNITYNAME
SET WRITECOMMUNITYNAME string
GET WRITECOMMUNITYNAME

Set or display the current read or write community name as specified. Note that in general these are case sensitive fields. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBENABLE ON[OFF]
GET WEBENABLE

Set or display the current state of web based access. The network module will not accept any HTTP requests when web enable is off. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBPASSWORD string
GET WEBPASSWORD

Set or display the current web password. Note that this is a case sensitive field. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBTIMEOUT seconds
GET WEBTIMEOUT

Set or display the current web timeout in seconds. After a period of inactivity of this many seconds, the network module will request a login. Note that the web timeout cannot be disabled any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBPORT N
GET WEBPORT

Set or display the current web port number. Changing the web port number from the default can be used to provide an additional level of security. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETENABLE ON[OFF]
GET TELNETENABLE

Set or display the current state of telnet based access. The network module will not accept any telnet requests when telnet enable is off. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETPASSWORD string
GET TELNETPASSWORD

Set or display the current telnet password. Note that this is a case sensitive field. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETTIMEOUT seconds
GET TELNETTIMEOUT

Set or display the current telnet timeout in seconds. After a period of inactivity of this many seconds, the network module will disconnect any current telnet session. Note that the telnet timeout cannot be disabled, it can however, be set arbitrarily large. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETPORT N
GET TELNETPORT

Set or display the current telnet port number. Changing the telnet port number from the default can be used to provide an additional level of security. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET MONITORIP [X.X.X.X]
GET MONITORIP

Set or display the IP address of the device that the A/B Switch is to PING to determine the active port alternate (A) or normal (B). Setting this to 0.0.0.0 disables the auto switch/recovery function. Any change will not become permanent until a SAVE operation is performed. The MONITORIP is the IP address used to control an optional auto recovery function. If enabled, the auto switch/recovery function will PING the monitor IP address. When the PING is successful, the A/B Switch will auto-switch to the normal path (B), connecting port B to the common port C. When the PING is not successful, the A/B Switch will auto-switch to the alternate path (A), connecting port A to the common port C.

SET MONITORMAC [X X X X X X]
GET MONITORMAC

Set or display the MAC (Ethernet) address of the device that the A/B Switch is to PING to determine the active port switch (A) or normal (B). This value is entered as a series of six HEX characters with spaces between each HEX character. If monitoring connectivity to a device on the same subnet as the A/B Switch internal Ethernet node, set the monitormac address parameters to the MAC address of the device being monitored. If monitoring connectivity to a device on a different subnet/network than the A/B Switch internal Ethernet node, set the monitormac address parameter to the MAC address of the gateway router on the A/B Switch subnet. If the monitormac address is set to 00 00 00 00 00 00, the A/B Switch will automatically determine the proper MAC address required for the PING packet by issuing an ARP request to the gateway router. Any change will not become permanent until a SAVE operation is performed.

SET MONITORINTERVAL [N]
GET MONITORINTERVAL

Set or display the time interval between PINGs issued by the internal Ethernet node in the A/B Switch, measured in 100 msec increments. To issue PINGs every 1.5 seconds, set this value to 15. The valid range is 1 to 255 (0.1 seconds to 25.5 seconds). A value of 0 disables the automatic switch/recovery function. Any change will not become permanent until a SAVE operation is performed.

SET MONITORFAILCOUNT [N]
GET MONITORFAILCOUNT

Set or display the number of successive PING attempts that must fail before the A/B Switch automatically switches to the alternate path and removes the normal path connection path. The valid range is 1 to 255. A value of 0 disables the automatic switch/recovery function. Any change will not become permanent until a SAVE operation is performed.

SET MONITOROKCOUNT [N]
GET MONITOROKCOUNT

Set or display the number of successive PING attempts that must succeed before the A/B Switch automatically switches back to the normal path and removes the alternate connection path. The valid range is 1 to 255. A value of 0 disables only the automatic recovery function – automatic switching will still operate if enabled. If auto recovery is disabled the user must manually switch back to the normal path via the front panel toggle switch or by issuing a "set system B" command. Any change will not become permanent until a SAVE operation is performed.

SET AUTHENTICATIONTRAP ON[OFF]
GET AUTHENTICATIONTRAP

Set or display the current state of authentication error traps. Authentication traps will be generated when this parameter is set to ON, and not when OFF. Note that this setting only affects the trap generation, and not how the network module handles an authentication failure. An authentication failure generally means that an SNMP access was attempted with an incorrect community name. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET ALERTTYPE [TRAP/SYSLOG]
GET ALERTTYPE

Set or display the type of alert messages sent by the A/B Switch when certain events such as a change in switch state occur. The A/B Switch can be configured to issue either syslog messages, or SNMP traps.

NOTE: At least one IP address must be entered using the "SET MANAGER N X.X.X.X" command before either syslog messages or traps will be issued. See Section 9 for a list of the traps supported by the A/B Switch, and see section 10 for a list of the supported syslog messages.

SET ADMINIP N X.X.X.X

Set administrator N (1-8) IP address. Up to 8 different administrator IP addresses can be entered. To remove an entry from the list, set the IP address to 0.0.0.0. If all 8 ADMIN IP addresses are 0.0.0.0 (no ADMIN IP addresses are configured) the A/B Switch will allow access via the Ethernet interface from any IP address, subject to the existing password and enable flags for each interface. If one or more ADMIN IP addresses are non-zero, the A/B Switch will only process messages received from the configured (non-zero) ADMIN IP addresses. All other messages will be ignored. This ADMIN IP address filtering feature applies to the telnet, web browser and SNMP Ethernet interfaces and to the PING reply functions. The ADMIN IP address filtering does not affect outgoing PING and ARP messages so the A/B Switch is still able to monitor any IP address for the "auto-switch" features. The administrator IP addresses can be different than the manager IP addresses. Any change will not become permanent until a SAVE operation is performed.

GET ADMINIP N

Display the IP address of administrator N (1-8). If no value is entered for "N", then all administrator IP addresses will be displayed.

ADMIN IP Addresses:
1: 192.168.1.113
2: 192.168.1.115
3: 192.168.1.149

SET MANAGER N X.X.X.X

Set SNMP manager N (1-16) IP address. Up to 16 SNMP MANAGER IP addresses can be entered for destinations of trap messages. Trap messages will be sent to all enabled MANAGER IP addresses. To remove an entry from the list, set the IP address to 0.0.0.0. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SNMP Manager Table:
1: 192.168.1.113
2: 192.168.1.115

GET MANAGER N

Display SNMP manager N (1-16) IP address.

GET MANAGER

Display all SNMP manager IP addresses.

PING X.X.X.X

Causes the A/B Switch to issue a single ICMP echo request packet to the designated IP address. If a response is received, the A/B Switch will display the message "Reply from X.X.X.X". If no response is received within 5 seconds, the A/B Switch will display the message "Request timed out."

SAVE

Save settings for next startup. All settings are stored in NV memory and restored upon power on. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

RESET

Causes a network system reboot and reloads all parameters from stored settings.

NOTE: You will lose your connection and have to log in again if giving this command from a telnet or web interface session.

SET DEFAULTS

Causes the A/B Switch configuration parameters to be restored to the factory settings. Any changes to the settings will not become permanent until a SAVE and RESET operation sequence is performed.

HELP

Displays a list of commands.

```
>help
D1000 CONSOLE COMMANDS:
GET ALL (display all parameters)
GET VERSION (display software versions)
GET[SET] SYSTEM [A/B] (control all system ports)
GET[SET] IPADDRESS [X.X.X.X]
GET[SET] SUBNETMASK [X.X.X.X]
GET[SET] GATEWAY [X.X.X.X]
GET[SET] PINGREPLY [ON/OFF]
GET[SET] SNMPENABLE [ON/OFF]
GET[SET] READCOMMUNITYNAME [string]
GET[SET] WRITECOMMUNITYNAME [string]
GET[SET] WEBENABLE [ON/OFF]
GET[SET] WEBPASSWORD [string]
GET[SET] WEBTIMEOUT [N] (seconds)
GET[SET] WEBPORT [N]
GET[SET] TELNETENABLE [ON/OFF]
GET[SET] TELNETPASSWORD [string]
GET[SET] TELNETTIMEOUT [N] (seconds)
GET[SET] TELNETPORT [N]
GET[SET] MONITORIP [X.X.X.X] (0.0.0.0 to disable)
GET[SET] MONITORMAC [X X X X X X] (X = HEX CHARS)
GET[SET] MONITORINTERVAL [N] (1/10 seconds, 0 to disable)
GET[SET] MONITORFAILCOUNT [N] (0 to disable)
GET[SET] MONITOROKCOUNT [N] (0 = no auto recover)
GET[SET] AUTHENTICATIONTRAP [ON/OFF]
GET[SET] ALERTTYPE [TRAP/SYSLOG]
GET[SET] ADMINIP N [X.X.X.X] (0.0.0.0 to disable an entry)
GET ADMINIP (display all administrator IP addresses)
GET[SET] MANAGER N [X.X.X.X] (0.0.0.0 to disable an entry)
GET MANAGER (display all SNMP managers)
PING X.X.X.X (ICMP ECHO to remote host)
SAVE save settings for next startup
RESET restart (use after SAVE)
SET DEFAULTS (restore default user settings, save required)
>
```

NOTES:

- *Commands can be entered in upper or lower case.*
- *All commands should be terminated with a carriage return (ASCII 13) or (hex 0x0D).*
- *Set/get system commands can be abbreviated using just first letters, i.e. "g s" for "get system" or "s s a" for "set system a."*

8. Web Interface (SW1041A Only)

The network module installed in Ethernet remote control capable models of the A/B Switch also provides access to console commands through a web browser interface. When enabled (see SET WEBENABLE command) entering the A/B Switch's IP address (index.html) in your web browser's URL address line will present a log on page for the A/B Switch similar to the following example.

NOTE: If using a pop up blocker on your web browser, be sure to allow pop ups from the IP address of the A/B Switch; otherwise, you could experience trouble receiving a response through the interface.

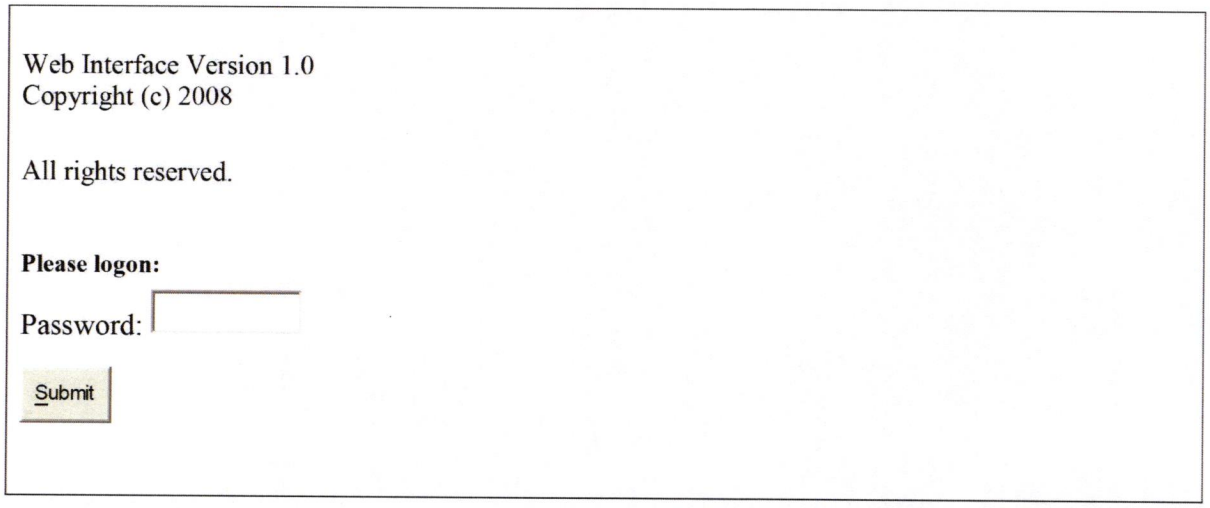


Figure 8-1. Logon screen.

After successfully entering the correct web password (see SET WEBPASSWORD command) you will get the following page (or similar).

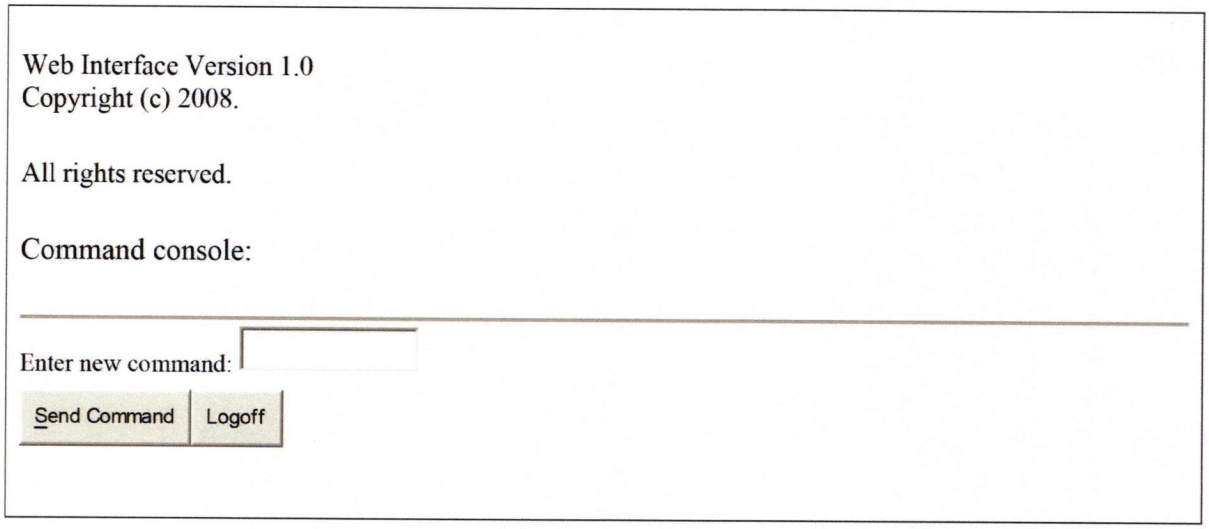


Figure 8-2. Initial Command screen.

At this point you may enter any valid command into the text box and click "Send Command" to execute. The following is an example result of the GET ALL command.

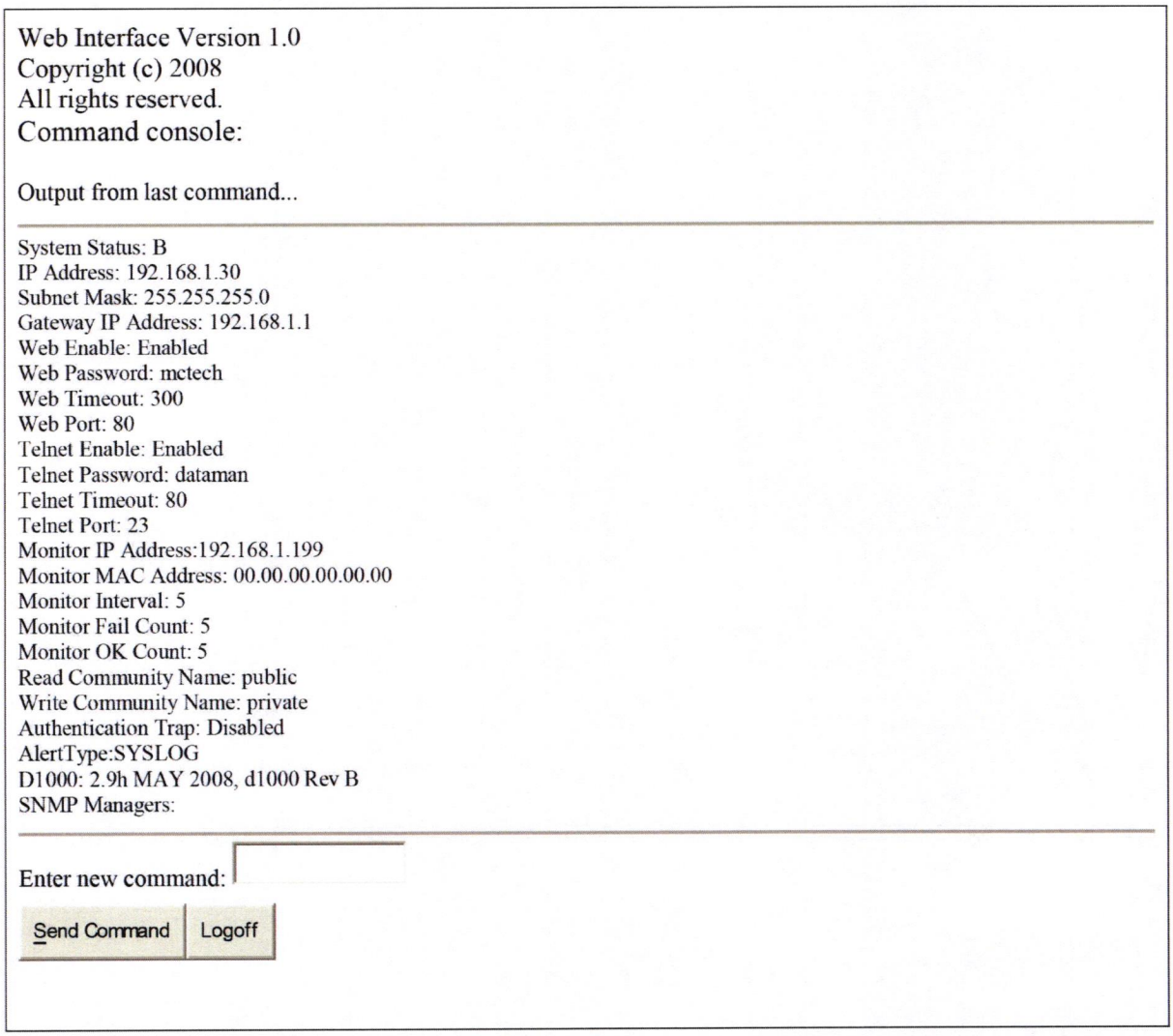


Figure 8-3. Example Command Results screen.

The A/B Switch will only allow 1 telnet or web access session. To free up a session without waiting for the web timeout, click "Logoff." For this reason, the web timeout should be set to a workable time. Resetting the A/B Switch will also clear the current web session.

9. SNMP MIB Path Summary

[internet] – 1.3.6.1
    [private] – 1.3.6.1.4
        [enterprises] – 1.3.6.1.4.1
            [mctech] – 1.3.6.1.4.1.9477

[mctech] – 1.3.6.1.4.1.9477
    Market Central, Inc. private enterprise number

[mcAgent] – 1.3.6.1.4.1.9477.1
    Market Central, Inc. SNMP Agent

The following is a list of the SNMP variables corresponding to: D1000 A/B Switch.

[d1000] – 1.3.6.1.4.1.9477.1.7
    D1000 Switch
    [d1000SwitchControl] – 1.3.6.1.4.1.9477.1.7.1
    [d1000KeyStat] – 1.3.6.1.4.1.9477.1.7.2
    [d1000PowerStat] – 1.3.6.1.4.1.9477.1.7.3
    [d1000SoftwareVersion] – 1.3.6.1.4.1.9477.1.7.4
    [d1000Name] – 1.3.6.1.4.1.9477.1.7.5

[mcIpRequester] – 1.3.6.1.4.1.9477.2

A/B Switch SNMP Variable Definitions:

[d1000SwitchControl] – 1.3.6.1.4.1.9477.1.7.1
D1000 Switch Control. This variable is used to control the selected channel. When set to A, the switch will connect channel A to C. When set to B, the switch will connect channel B to C.

[d1000KeyStat] – 1.3.6.1.4.1.9477.1.7.2

D1000 Key-Lock Switch Status. This is a read only variable. This variable can be used to determine if the

Key-Lock Switch is in the OFF or ON position. Although the standard A/B Switch does not have a Key-

Lock Switch, this feature is supported and could be added on future models.

[d1000PowerStat] – 1.3.6.1.4.1.9477.1.7.3
D1000 Power Status. This is a read only variable. Since the A/B Switch is powered via a single power supply, the Power Status will report "OneSupply."

[d1000SoftwareVersion] – 1.3.6.1.4.1.9477.1.7.4
D1000 Software Version. This is a read only variable, and is limited to a maximum of 14 characters.

[d1000Name] – 1.3.6.1.4.1.9477.1.7.5
D1000 Identification String. The string is limited to a maximum of 14 characters.

[mcIpRequester] – 1.3.6.1.4.1.9477.2
The IP address of the remote entity that last accessed branch 1.3.6.1.4.1.9477.1. This variable can be used to identify the last IP address to access any mcAgent variable. It is returned in the authenticationFailure message.

10. Traps Summary

The A/B Switch can be configured to issue an SNMP trap when certain events occur. Use the "SET ALERTTYPE" command to enable traps, and use the "SET MANAGER N X.X.X.X" command to specify the IP addresses of up to 16 different NMS computers that you want to send these traps to (see Section 7 for details regarding these commands). The following traps are generated by the A/B Switch. For additional details regarding theses traps, and the SNMP MIB objects supported by the A/B Switch, please refer to the d1000.mib file supplied with your switch.

generic trap 0 coldStart – issued when the unit is powered up, or after a RESET command

generic trap 4 AuthenticationFailure – issued when an invalid SNMP read/write community name is used when attempting to access the A/B Switch

specific trap 6 SystemSwitchChange – issued in response to a switching action caused by a user initiated command, front panel push button action, or remote dry contact closure

specific trap 8 AutoSwitchChange – issued when the A/B Switch automatically changes connection states via the auto switch feature, or the auto recovery feature

11. Syslog Messages

The A/B Switch can be configured to issue a syslog message rather than an SNMP trap when certain events occur. To configure the A/B Switch to issue syslog messages, you must use the "SET ALERTTYPE" command to select SYSLOG messages, and you need to specify the IP address(es) of the device(s) that will be receiving the syslog messages by using the "SET MANAGER N X.X.X.X" command (see Section 7 for details regarding these commands). Once these configuration changes have been made, the A/B Switch will issue syslog messages for the following types of events:

- power up cold start, or restart using the RESET command
- SNMP authentication failure (access attempted using incorrect read or write community name)
- switching action caused by a user initiated command, front panel push button action, or remote dry contact closure
- auto switch or auto recovery switch functions

The syslog messages issued by the A/B Switch conform where possible to the general recommendations as described in rfc3164. There is no real time clock within the A/B Switch however, so each syslog message uses a default timestamp value of Jan 1 00:00:00. The device receiving the syslog messages will need to apply a timestamp or other identifier if this information is needed. The general format for each syslog message from the A/B Switch is as follows:

Jan 1 00:00:00 [IP address] Bypass Switch: [specific message based on the event that occurred]

Listed below is each type of syslog message that the A/B Switch can issue, followed by the actual syslog message that the A/B Switch will send.

Syslog Messages

power up cold start (or RESET command)
Jan 1 00:00:00 192.168.1.151 Bypass Switch: Switch has been reset.

SNMP authentication failure
Jan 1 00:00:00 192.168.1.151 Bypass Switch: SNMP authentication failure.

system switch A to B via S S B command (or toggle switch)
Jan 1 00:00:00 192.168.1.151 Bypass Switch: System switch from A to B position.

system switch B to A via S S A command (or toggle switch)
Jan 1 00:00:00 192.168.1.151 Bypass Switch: System switch from B to A position.

auto switch B to A via auto bypass feature
Jan 1 00:00:00 192.168.1.151 Bypass Switch: Automatic switch from B to A position.

auto switch A to B via auto recovery feature
Jan 1 00:00:00 192.168.1.151 Bypass Switch: Automatic switch from A to B position.

BLACK BOX®

About Black Box

Black Box provides an extensive range of networking and infrastructure products. You'll find everything from cabinets and racks and power and surge protection products to media converters and Ethernet switches all supported by free, live 24/7 Tech support available in 60 seconds or less.

SW1040A_SW1041A version 1

MINUTEMAN®
POWER TECHNOLOGIES
by Para Systems, Inc.

PRO-RT® Series Line-Interactive UPS

PRO750RT2U, PRO1000RT2U, PRO1500RT2U, PRO2000RT2U

Perfect Protection For Rack-Mount Systems

The PRO-RT Series is a value-priced, yet feature-rich UPS incorporating line-interactive technology that preserves battery power by providing voltage regulation during brownouts or voltage sags. The PRO-RT Series can be used to support servers, telecom or VoIP systems, security systems, plus many other applications.

The PRO-RT UPSs include many useful features such as load-shedding with two load banks, independent battery bypass, plus auto-re-start when power is restored after an extended power outage.

Versatile Communications

Each PRO-RT model is compatible with Minuteman's free downloadable SentryHD™ power management and diagnostic software. When installed on a workstation or server, the user gains complete control over monitoring and managing the UPS using a convenient web browser-based interface. The SentryHD software communicates via a built-in USB port on the UPS. In addition, managing the UPS within a Network Management System (NMS) is easy with the installation of an optional SNMP card.

Designed for versatility, the PRO-RT models can be mounted in a standard rack using the attached rackmount ears. All units can also be installed as a tower using the included feet. An optional kit is available for mounting the unit to a wall.

High-end Features - Budget Friendly Price

The PRO-RT offers many features normally found on higher priced models, including an LCD status display which shows the following:

- **Input / Output voltage and frequency**
  Monitor the status of your utility power
- **UPS and battery mode / status**
  Eliminate guesswork with straightforward display of the unit's status
- **Load capacity**
  Load indicator shows how much electrical load is being placed on the unit
- **Estimated runtime based on connected load**
  Find out how much backup time remains during a blackout right on the unit

Ideally Suited to Protect:

- Network Equipment
- Servers
- Workstations
- VoIP Communications
- Telephone Systems
- IP and Analog Video Equipment

Capacity

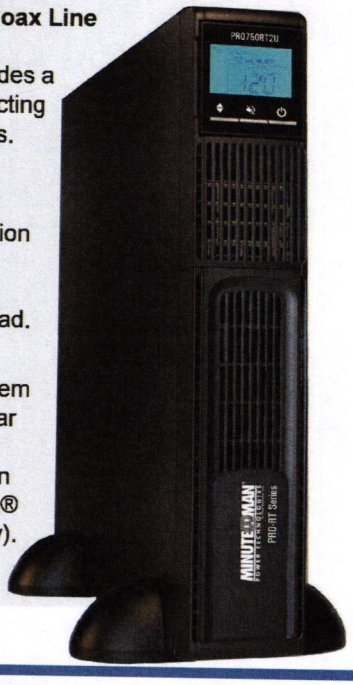
☑ Small ☑ Midsize ☐ Enterprise level

Applications

☑ Network/Server ☑ VoIP Systems ☑ IP/Analog Phone & Security

In addition to the LCD display, the PRO-RT also offers:

- **Protection from Spikes, Surges, Brownouts, and Blackouts**
  - Buck and boost Automatic Voltage Regulation (AVR) function
  - All outlets are battery and surge-protected
  - RJ11 / RJ45 spike/surge protection for phone/fax/modem/network connections (1Gb)
  - Coax protection for satellite/cable
- **Rack/tower Installation**
  2U rack height or wall mounting with optional kit
- **Minuteman SentryHD Software**
  - Automatically saves and shuts down unfinished or open applications programs
  - Powers down your devices during blackouts
  - Provides comprehensive power monitoring
- **USB Communications**
  No special USB drivers are required. The USB is automatically recognized by Microsoft® Windows® as HID-compliant devices – similar to a mouse or a keyboard.
- **SNMP Compatible**
  Each PRO-RT unit can be managed on a network with the addition of an optional SNMP management card. (NC models includes a pre-installed network card)
- **Fax/Modem/Network/Coax Line Protection**
  The PRO-RT UPS provides a low cost means of protecting fax/modem/network lines.
- **Independent Battery Bypass**
  Provides voltage regulation with surge and spike protection even when batteries are weak or dead.
- **Warranty**
  Each PRO-RT UPS system is covered by a three-year parts and labor warranty and $100,000 Minuteman Platinum Protection Plan® (U.S.A. and Canada only). Five-year warranty options are available.



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Minuteman® PRO-RT® Series Line-Interactive UPS Specifications

NC models include a pre-installed network card

General Specifications	PRO750RT2U	PRO1000RT2U	PRO1500RT2U	PRO2000RT2U
Max Output Power	525 Watts	700 Watts	1050 Watts	1400 Watts
Power Factor	0.7	0.7	0.7	0.7
Topology	Line-Interactive			
Mounting/Installation	Rackmount / Tower / Wallmount (optional kit)			
Output Receptacles	(8) NEMA 5-15R	(8) NEMA 5-15R	(8) NEMA 5-15R	(6) NEMA 5-15/20R / (1) L5-20R
Input Connection	10' power cord with NEMA 5-15P			10' power cord w/5-20P
Load-Shedding Configuration	(2) Independently-controlled banks of (3) outlets + (1) always-on bank of (2) outlets {PRO2000RT2U (1) always on L5-20R Outlet}			
Warranty	Three-year parts and labor warranty			
Equipment Guaranty	$100,000 Platinum Protection Plan			
Input				
Voltage Range	90 to 150VAC			
Frequency Range	60Hz ±6Hz			
Output (non-battery operation)				
Voltage Range	103 to 136VAC			
Frequency	60Hz ±6Hz.			
Wave Form	Sine Wave			
Efficiency (AC-AC)	>96% at full-rated load			
Output (battery operation)				
Voltage	120VAC			
Voltage Regulation	120VAC ±5% until low battery warning			
Frequency	60Hz ±0.5Hz unless synchronized to line			
Wave Form	Simulated sine wave			
Battery System				
Hot Swappable Battery	Yes			
Battery Type	Sealed, non-spillable, valve regulated, maintenance-free, lead acid			
Runtime at Half-Full-Rated Load	15 (5) minutes	14 (4) minutes		
Surge Protection				
Surge Energy Rating	960 joules			
Surge Protection	RJ11 / RJ45 and Coax			
Certifications				
Agency Approvals	cTUVus (Conforms to UL1778 and CSA 22.2), CE, RoHS2, Energy Star			
EMI/RFI Emissions and Susceptibility	FCC Part 15 Class B			
Environmental				
Temperature : Operating (Storage)	0° to +40°C / +32° to +104°F (-15° to +45°C / +5° to 113°F)			
Humidity: Operating (Storage)	5 to 95% non-condensing			
Elevation: Operating (Storage)	0 to +3,000 m / 0 to +10,000 ft (0 to +15,000 m / 0 to +50,000 ft)			
Physical				
Unit Size (L x W x H) (with rack ears installed)	16.1 x 18.9 x 3.4 inches (409 x 480 x 86 mm)		20.1 x 18.9 x 3.4 inches (510 x 480 x 86 mm)	
Unit Weight	31.3 lbs 14.2 kgs	35.7 lbs 16.2 kgs	48.7 lbs 22.1 kgs	62.8 lbs 28.5 kgs

PRO-RT Series Features

1 LCD Status Display
2 Rackmount Brackets
3 Input Circuit Breaker
4 Input Power Cord
5 Coax Surge Protection
6 Emergency Power Off
7 Fan
8 USB Port
9 RJ11/RJ45/Fax/Modem Network Protection
10 Controllable Output Receptacles (6)
11 Always On Receptacles (2)
(Only one on the PRO2000RT2U)
12 Option Card Slot